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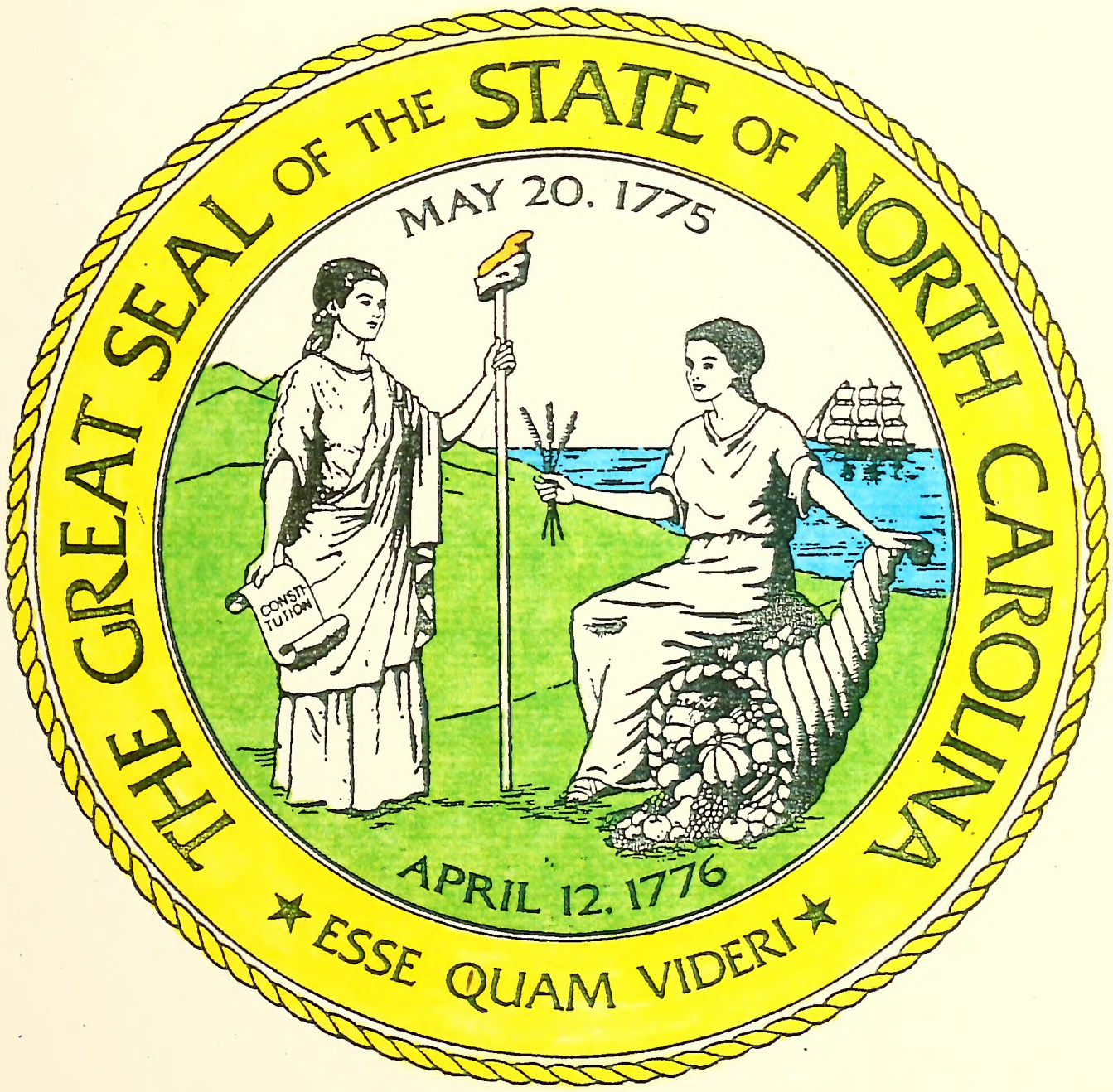
North Carolina Department of Transportation
Statewide Planning Branch

# Thoroughfare Plan

for

# CABARRUS COUNTY




1994

# THOROUGHFARE PLAN

# FOR

# CABARRUS COUNTY

Prepared by the
Systems Planning Unit
Statewide Planning Branch
Division of Highways
North Carolina Department of Transportation

| | |
|---|---|
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TABLE OF CONTENTS


| | | Page |
|---|---|---|
| I. | Introduction | I-1 |
| II. | Thoroughfare Planning Principles | II-1 |
| | A. Purpose of Planning | II-1 |
| | B. County Thoroughfare Planning Concept | II-1 |
| III. | Functional Classification Systems | III-1 |
| | A. Urban Classification System | III-1 |
| | B. Rural Classification System | III-1 |
| | C. Classification of Cabarrus County System | III-2 |
| IV. | Regional Characteristics | IV-1 |
| | A. Population and Economy | IV-1 |
| | B. Physical Characteristics | IV-1 |
| | C. Historical Effects | IV-1 |
| | D. Environmental Effects | IV-2 |
| V. | Traffic Characteristics | V-1 |
| | A. Traffic Volume | V-1 |
| | B. Traffic Accidents | V-1 |
| VI. | Deficiency Analysis | VI-1 |
| | A. Capacity | VI-1 |
| | B. Design Characteristics | VI-2 |
| | C. Levels of Service | VI-3 |
| | D. Bridges | VI-7 |
| | E. Secondary Roads | VI-12 |
| | F. Transportation Improvement Program | VI-12 |
| VII. | Recommendations | VII-1 |
| | A. Municipal Thoroughfare Plans | VII-1 |
| | B. 1994 Thoroughfare Plan | VII-5 |
| | 1. Explanation of Changes to 1985 Plan | VII-5 |
| | 2. Recommended Improvements | VII-5 |
| | C. Other Projects | VII-8 |
| | D. Improvement Priorities | VII-8 |
| VIII. | Implementation | VIII-1 |
| | A. State-County Adoption of the Thoroughfare Plan | VIII-1 |
| | B. Subdivision Regulations | VIII-1 |
| | C. Land Use Controls | VIII-1 |
| | D. Funding | VIII-1 |

Appendices

## List of Figures


| | | Page |
|---|---|---|
| Figure 1 | Map of Cabarrus County | I-2 |
| Figure 2 | Idealized Thoroughfare Plan | III-5 |
| Figure 3 | Schematic Illustration of a Functionally Classified Rural Highway Network | III-7 |
| Figure 4 | ADT in Cabarrus County | V-3 |
| Figure 5 | Person-per-Vehicle Rate for Cabarrus County and North Carolina | V-5 |
| Figure 6 | High Accident Locations | V-7 |
| Figure 7 | Levels of Service | VI-5 |
| Figure 8 | Structurally Deficient and Functionally Obsolete Bridges | VI-9 |
| Figure 9 | Proposed NC 49 Bypass | VII-3 |
| Figure 10 | Cabarrus County Thoroughfare Plan | VII-13 |
| Figure 11 | Cabarrus County Construction Plan | VII-15 |


## List of Tables


| | | |
|---|---|---|
| Table 1 | Rural System Road Mileage Distribution | III-2 |
| Table 2 | Population Data | IV-1 |
| Table 3 | In-commuters to Cabarrus County | IV-2 |
| Table 4 | Out-commuters from Cabarrus County | IV-2 |
| Table 5 | Ideal Average Travel Speeds for Roads | VI-2 |
| Table 6 | Minimum Tolerable Lane Widths | VI-7 |
| Table 7 | Structurally Deficient Bridges | VI-11 |
| Table 8 | Functionally Obsolete Bridges | VI-12 |
| Table 9 | Environmental Considerations | VII-9 |
| Table 10 | Benefits and Costs of Cabarrus County Projects | VII-10 |


## Appendices


| | | |
|---|---|---|
| Appendix A | Recommendations | A-1 |
| Appendix B | Vehicle Registration | B-1 |
| Appendix C | Typical Cross Sections | C-1 |
| Appendix D | Recommended Subdivision Ordinances | D-1 |
| Appendix E | Design Standards | E-1 |
| Appendix F | General Law: House Bill 815 | F-1 |

# I. INTRODUCTION

Cabarrus County is in Planning Region F, the most populous region of the state. This region is also a critical economic region as it is home to Charlotte and, within the County, the KANLACON Urban Area. This region is an important textile manufacturing area.

With the region's large population and industrial/commercial importance, strict attention must be given to the highway system serving the region. The system must adequately provide for the safety, health, and welfare of the traveling public. Highways that have many accidents or long travel time delays due to congestion must be improved. In addition, efficient access must be provided to areas of commercial or industrial importance.

The economic development of a region is influenced by how efficient the transportation system handles travel demands. If the system fails to provide efficient transportation of people and goods, the region's economic growth will fail to reach its potential. It is necessary that the transportation system meet existing travel demands and keep pace with development in the region.

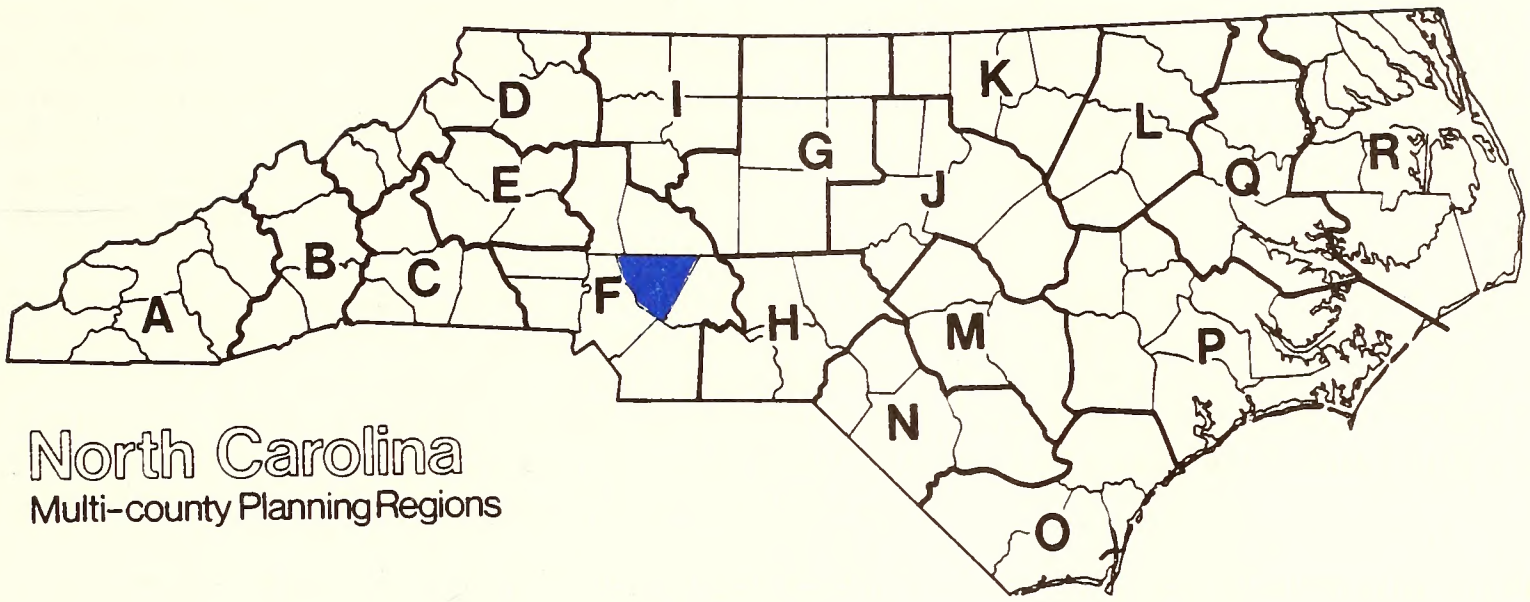
With the continuing growth of Charlotte, Cabarrus County is experiencing new growth and increased traffic as a border county to the city. Large volumes of traffic are attracted to the County as a result of the KANLACON Urban Area and the Charlotte Motor Speedway. Daily commuter traffic is attracted to large industrial and manufacturing centers such as Philip Morris which employs about 2000 people.

This plan will update the 1985 Cabarrus County Thoroughfare Plan and establish a system of roads to handle anticipated traffic needs through the year 2020. The system will be established with priorities based on maintenance needs, bridge inadequacies, design deficiencies, and capacity problems.

Most of the proposed improvements will be the responsibility of the North Carolina Department of Transportation. In implementing the plan, Cabarrus County can provide assistance through subdivision regulations and zoning ordinances. In addition, Cabarrus County has, through local legislation, acquired the ability to purchase rights-of-way with County funding. See appendix F for additional information. It will be advantageous for the plan to be adopted by both the County Commissioners and North Carolina Board of Transportation.

This plan will not attempt to update or alter the plan for either Harrisburg or the KANLACON Urban Area. A coordinated effort will work to match the needs of both county and municipalities.

# CABARRUS COUNTY
# GEOGRAPHIC LOCATION



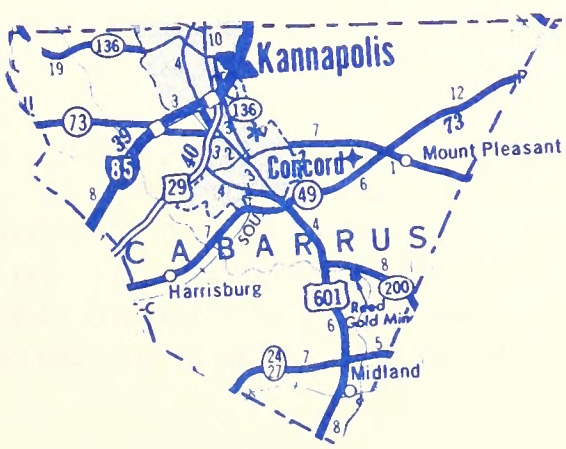




FIGURE 1

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http://www.archive.org/details/thoroughfarepl1994nort

# II. COUNTY THOROUGHFARE PLANNING PRINCIPLES

## A. Purpose of Planning

There are many benefits to be gained from thoroughfare planning. The main objective is to assure that the road system will be progressively developed to serve present and future travel needs. Thus, the main consideration in thoroughfare planning is to make provisions for street and highway improvements so that, when the need arises, improvements can be made. Developing a comprehensive transportation plan will allow officials to effectively coordinate land use and the transportation system. Protecting the Right-of-Way of a proposed facility from future development is one way this can be accomplished.

Streets, roads, and highways have two primary functions of providing traffic and land service. When combined, these two services are essentially incompatible. This conflict will not be serious if both traffic and land service demands are low. When traffic volumes are high, access conflicts created by abutting properties result in traffic problems.

Some of the benefits derived from thoroughfare planning are: (1) Each street can be designed to perform a specific function. This permits savings in right-of-way and construction costs; and encourages stability in travel and land use patterns. (2) Local officials and citizens are informed as to future improvements. Public facilities can be better located; and damage to property and appearance can be minimized (for example: buildings and plants can be located to permit future street widening). (3) Residents will know which streets will be developed as major thoroughfares and be able to make an informed decision when choosing a home.

## B. The Concept of County Thoroughfare Planning

The underlying concept of the thoroughfare plan is to provide a functional system of streets, roads, and highways that permit direct, efficient, and safe travel. Different elements in the system are designed to have specific functions and levels of service. This will minimize the traffic and land service conflict.

In the county plan, elements are designated as either urban or rural. In the urban planning area, the local municipality generally has planning jurisdiction. Outside the urban planning area, the county has planning jurisdiction. In those urban areas where no urban thoroughfare plan has been developed, elements are generally designated as rural and under the planning jurisdiction of the county.

Within the urban and rural systems, thoroughfare plan elements are classified according to the specific function they are to perform. A discussion of the elements and functions of the two systems follows.

# III. FUNCTIONAL CLASSIFICATION SYSTEM

## A. Urban Thoroughfare Classification System

In the urban thoroughfare plan, elements are classified as major thoroughfares, minor thoroughfares, or local access streets. The major thoroughfares are the primary traffic arteries of the urban area providing for traffic movements within, around, and through the area. Minor thoroughfares are designed to collect traffic from the local access streets and carry it to the major thoroughfare system. Local access streets, which may be further classified as residential, commercial, or industrial streets, are designed only to provide access to abutting property. Due to the limited amount of detail that can be shown on a county thoroughfare plan, only major urban thoroughfares are shown.

The coordinated system of major thoroughfares that is most adaptable to the lines of travel within an urban area and that is reflected in most urban area thoroughfare plans is the radial-loop system. The radial-loop system includes radials, crosstowns, loops, and bypasses. Radial thoroughfares provide for travel from points outside the urban area to major internal destinations. Crosstown thoroughfares provide for traffic movement across the central area and around the central business district (CBD). Loop thoroughfares provide for lateral travel movements between suburban areas. Bypasses are designed to carry non-local traffic around and through the area. Occasionally, a bypass with low through traffic volumes can be designed to function as a portion of the urban loop. The radial-loop system and urban thoroughfare classification street system are illustrated in **Figure 2.**

## B. Rural Thoroughfare Classification System

The following discussion is an overview of the basic concept of the rural county classification system. The function of each system is based on a statewide perspective. A list of each functional classified facility for Cabarrus County is outlined on page 2.

The rural system consists of those roadways outside the urban thoroughfare planning boundaries. They are classified into four major systems: principal arterials, minor arterials, major and minor collectors, and local roads. **Figure 3** is a schematic of a rural system.

Rural Principal Arterial System - This system consists of a connected network of continuous routes that serve corridor movements having substantial statewide or interstate travel characteristics. This will be shown by the trip lengths and travel densities. The principal arterial system should serve all urban areas of over 50,000 population and most of those with population greater than 5,000. The Interstate system is a significant portion of the principal arterial system.

Rural Minor Arterial System - This system, in conjunction with the principal arterial system, forms a network that links cities, large towns, and other major traffic generators such as large resorts. The minor arterial system generally serves interstate and

intercounty travel and travel corridors having trip lengths and travel densities lesser than the principal arterial system.

Rural Collector Road System - The rural collector routes generally serve intracounty travel instead of statewide travel. This system consists of those routes on which the predominant travel distances are shorter than on arterial routes. The rural collector road system is subclassified into major and minor collector roads.

Major Collector Roads - These routes provide service to larger towns not directly served by arterials. They also serve other traffic generators having county-wide significance, such as consolidated schools, shipping points, county parks, and significant mining and agricultural areas. Major collector roads link these places to arterial routes and serve important county travel corridors.

Minor Collector Roads - These routes collect traffic from local roads and bring all developed areas within a reasonable distance of a major collector road. Minor collectors also provide service to remaining small communities and link locally important traffic generators with the rural outskirts.

Rural Local Road System - The local roads are all roads that are not on one of the other systems. Local residential subdivision streets and residential collector streets are elements of the local road system. Local residential streets are either cul-de-sacs, loop streets shorter than 2,500 feet, or streets less than one mile not connecting thoroughfares or serving major traffic generators. These roads also do not collect traffic from more than 100 dwelling units. Residential collector streets serve as the connecting system between local residential streets and the thoroughfare system.

Table 1 indicates generally accepted statewide mileage on the rural systems.

Table 1 - Rural System Road Mileage Distribution

| Systems | Percentage of Total Rural Miles |
|---|---|
| Principal Arterial System | 2 - 4% |
| Minor Arterial System | 4 - 8% |
| Collector Road System | 20 - 25% |
| Local Road System | 65 - 75% |

## C. Classification of Cabarrus County System

The following is a list of the classified facilities for the rural sections of Cabarrus County.

Principal Arterials:

**US 52** from the northeast corner of the county from Rowan County to Stanly County.

**NC 49** from the KANLACON Metropolitan Area Boundary (MAB) to Stanly County.

**NC 73** from Mecklenburg County to the KANLACON Metropolitan Area Boundary (MAB).

Minor Arterials:

**US 601** from Union County to KANLACON MAB.

**NC 24/27** from Mecklenburg County to Stanly County.

Major Collectors:

**NC 73** from KANLACON MAB to Stanly County.

**NC 136** from SR 1442 to Iredell County.

**NC 200** from Stanly County to US 601.

**SR 1006 (Mt Pleasant)** from Rowan County to US 601.

**SR 1106 (Furr Road)** from SR 1006 to US 601.

**SR 1139 (Flowes St.)** from Mecklenburg County to KANLACON MAB.

**SR 1168 (Robinson Church Road)** from Mecklenburg County to the KANLACON MAB.

**SR 1394 (Poplar Tent Road)** from Mecklenburg County to the KANLACON MAB.

Minor Collectors:

**SR 1132 (Miami Church Road)** from the KANLACON MAB to NC 24/27.

**SR 1136 (Lower Rocky River)** from SR 1139 to Mecklenburg County.

**SR 1449 (Harris Road)** from Mecklenburg County to SR 1394 (Poplar Tent Road).

**SR 1601 (Odell School Road)** from NC 136 to the KANLACON MAB.

**SR 2400 (Barrier Road)** from the KANLACON MAB to SR 2411.

**SR 2408 (Gold Hill Road)** from the KANLACON MAB to SR 1006 (Mt. Pleasant)

**SR 2411 (Irish Potato Road)** from SR 2400 to SR 1006.

**SR 2444 (St. Stephens Church Road)** from Rowan County to NC 49.

**SR 2622 (Barriers Store Road)** from SR 1006 to Stanly County.

**SR 2635 (Old Airport Road)** from KANLACON MAB to NC 49.

# IDEALIZED THOROUGHFARE PLAN

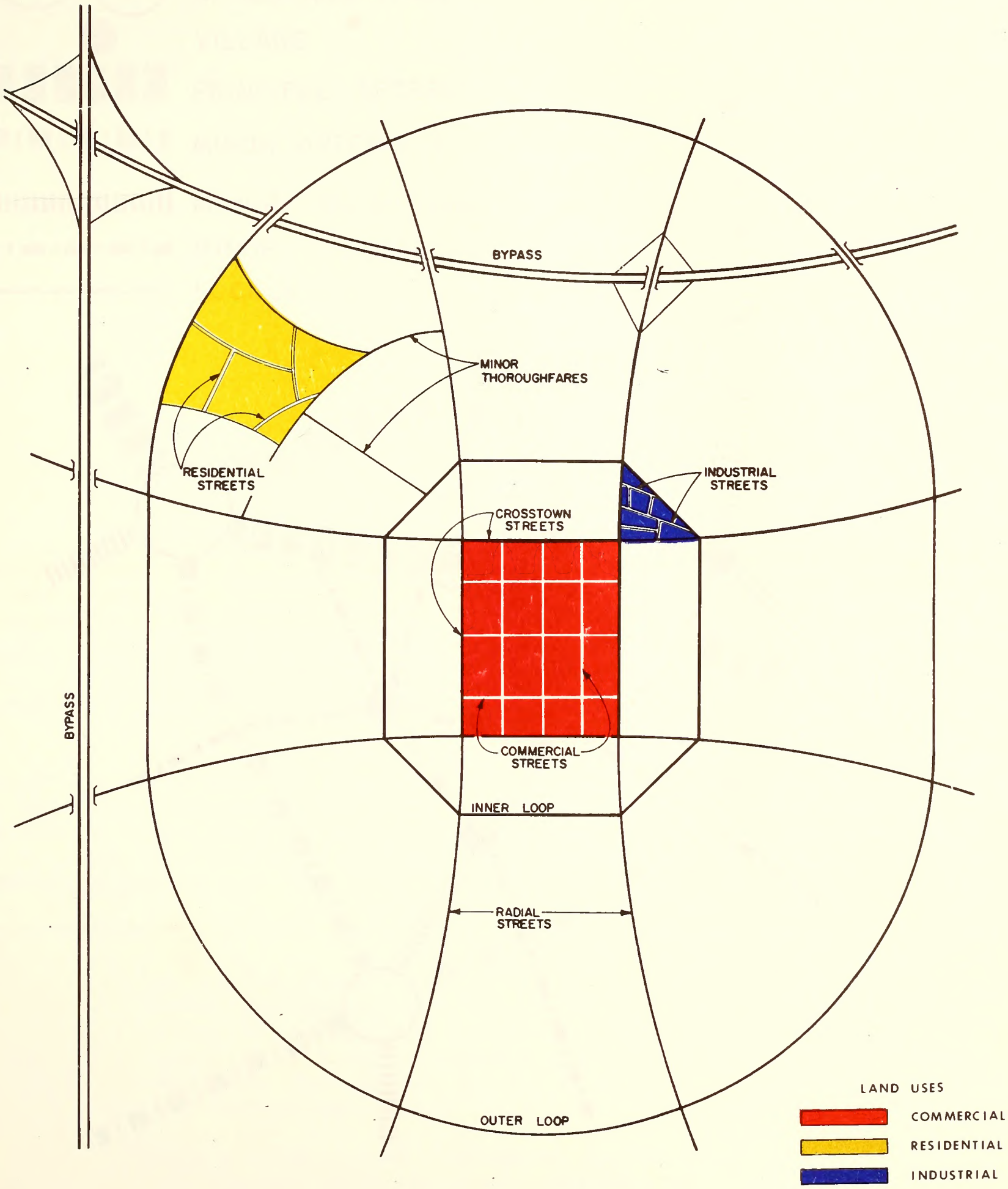
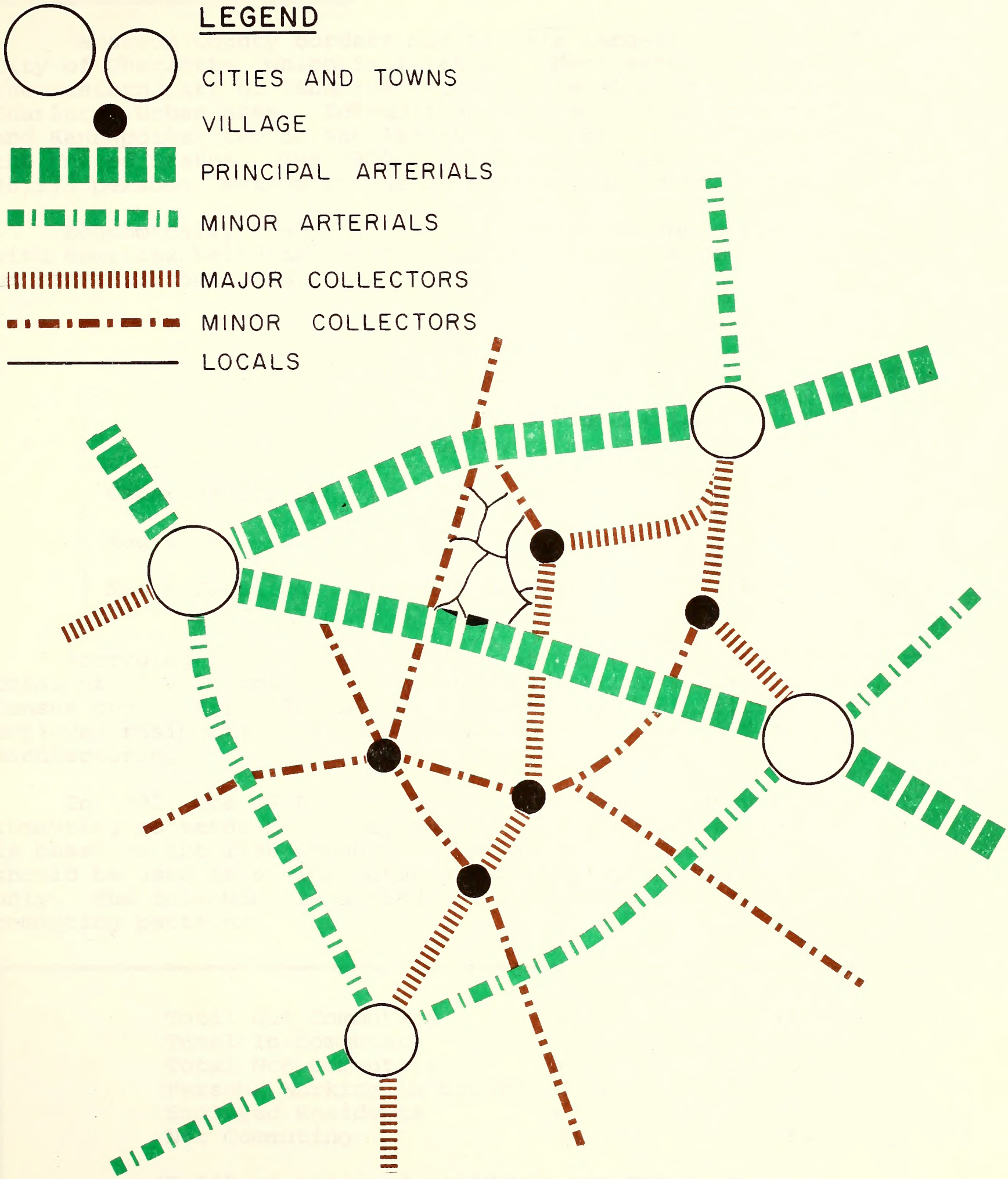



FIGURE 2




SCHEMATIC ILLUSTRATION
OF FUNCTIONALLY CLASSIFIED
RURAL HIGHWAY NETWORK

**FIGURE 3**

FIGURE 3

# RURAL HIGHWAY NETWORK OF FUNCTIONALLY CLASSIFIED SCHEMATIC ILLUSTRATION

# IV. REGIONAL CHARACTERISTICS

## A. Population and Economy

Cabarrus County borders the state's largest urban area; the City of Charlotte, which is located in Mecklenburg County. Much of the western part of Cabarrus County is developing as suburbs to the Charlotte Urban Area. In addition, the county is home to Concord and Kannapolis, two of the largest areas of textile manufacturing in the United States. The 1990 population of Cabarrus County was 98,935 persons, making it one of the largest counties in the state.

Economically, Cabarrus County remains an industrial county, with textiles being the main industry. Cabarrus County also relies on its livestock production.

Table 2
Population Data

| Area | Population 1970 | 1990 | 2020 |
|---|---|---|---|
| Cabarrus County | 74,629 | 98,935 | 133,072 |
| Region F | 870,150 | 1,175,292 | 1,707,875 |
| North Carolina | 5,084,411 | 6,628,637 | 8,727,295 |

According to the State Library of North Carolina, there were a total of 35,259 employed residents of Cabarrus County in 1970. Census counts for 1990 show an increase of 44.8% (51,039) of total employed residents. Of those employed, nearly 17,000 are in manufacturing.

In 1992, the US Bureau of Census released County Employment commuting patterns for every county in North Carolina. This data is based on the 1990 Census of Population and Housing survey and should be used as an indicator of the employment travel patterns only. The following is a statistical summary of Cabarrus County commuting patterns.

| | | |
|---|---|---|
| Total Out-Commuters | = | 21,918 |
| Total In-Commuters | = | 12,883 |
| Total Non-Commuters | = | 29,121 |
| Persons Working in County | = | 42,004 |
| Employed Residents | = | 51,039 |
| Net Commuting | = | -9,035 |

42.94% of employed residents are Out-Commuters.
30.67% of the employed in county workers are In-Commuters.

Table 3 and 4 list the top 5 county commuters, including In-Commuters and Out-Commuters.

**Table 3**
**In-Commuters**
**to Cabarrus County**

| Location of Residence | In-Commuters |
|---|---|
| Rowan County | 8,040 |
| Mecklenburg County | 2,218 |
| Stanly County | 1,038 |
| Iredell County | 301 |
| Union County | 172 |

**Table 4**
**Out-Commuters**
**from Cabarrus County**

| Location of Work | Out-Commuters |
|---|---|
| Mecklenburg County | 16,603 |
| Rowan County | 2,960 |
| Stanly County | 598 |
| Union County | 374 |
| Iredell County | 212 |

B. Physical Characteristics

Cabarrus County covers 394 square miles in the southern Piedmont of North Carolina. It is bordered on the west by Mecklenburg County, north by Iredell and Rowan County, east by Stanly County, and south by Union County. The terrain is mostly rolling hills with an elevation up to 800 feet above sea level. There are many small streams and tributaries in Cabarrus County with the Rocky River being the largest.

C. Historical Effects

The Archaeology and Historic Preservation Section of the Department of Cultural Resources has listings of historic properties within the state. Among these are the National Register of Historic Places. This register is a listing of sites that are considered to be nationally significant architectural historic structures.

There are National Register properties located in Cabarrus County. Many of these are located outside of the KANLACON and Harrisburg municipal jurisdictions and will therefore affect the County Thoroughfare Plan. One of the properties, Reed Gold Mine, is a National Historic Landmark. A detailed study of historic locations will be conducted in the project plan for any recommended improvements accepted for construction. The Planning and Environmental Branch of the North Carolina Department of Transportation will be responsible for this study.

D. Environmental Effects

There are several environmentally sensitive areas in Cabarrus County listed on the Natural Heritage Program maps with the Department of Cultural Resources. Wetlands information is not presented here due to a lack of detailed wetlands mapping for Cabarrus County. A detailed environmental study will be conducted in the project planning process.

# V. TRAFFIC CHARACTERISTICS

## A. Traffic Volume

In the analysis of historical traffic counts for Cabarrus County, several primary and secondary road traffic volumes were projected to the planning year 2020. For each location on a given road, Average Daily Traffic (ADT) counts from 1976 to 1990 were used in a linear regression analysis to estimate future ADT counts. Graphical trend lines for each location assisted in the analysis by estimating future ADT's through a computer generated program. **Figure 4** shows the ADT's for selected locations throughout Cabarrus County.

The counts for each location were then adjusted depending on population growth, registered vehicles, and planned development for that area. It should be emphasized that this process is an estimate, but there were many different sources to base it on. These sources included: (1) local planning department provided information on planned development and growth trends (ie. King's Grant; Cabarrus County Statistical Profile, November 1991); (2) field investigations allowed for the observation of traffic flow operations as well as a visual inspection of the current growth patterns (ie. newly constructed commercial and residential property; zoned comercial or residential property for sale); (3) KANLACON Urban Coordinator provided insight on residential and commercial development within the MAB and its effect on rural traffic patterns.

As a result of the observations and analysis, the following conclusions were made.

1) Due to the current and anticipated growth of the Charlotte and KANLACON Urban Areas, the rural areas of Cabarrus County most effected are the Western and Southern areas of the County.

2) Based on the increasing commuting patterns for the county, those facilities providing intercounty travel would be most affected.

3) As a traffic standpoint, the traffic volumes on the following facilities were projected based on moderate growth.

   - NC 24/27 from Mecklenburg County to Stanly County.
   - US 601 from Union County to SR 1006 (Mt. Pleasant).
   - NC 73 from Mecklenburg County to the KANLACON MAB.
   - SR 1139 (Flowes St.) from Mecklenburg County to the KANLACON MAB.
   - SR 1168 (Robinson Church Road) from Mecklenburg County to Harrisburg Urban Area Boundary.
   - SR 1136 (Lower Rocky River) from Mecklenburg County to SR 1139.
   - SR 1132 (Miami Church Road) from KANLACON MAB to NC 24/27.

Vehicle registration has increased at a much greater rate than population since 1940. This increase can be shown best by a graph depicting the change in persons per vehicle ratio over time. This ratio is obtained by dividing the total population of the area by the total number of vehicles registered in that area. **Figure 5** shows this comparison for North Carolina and Cabarrus County and includes projections to the year 2020. The results illustrate the

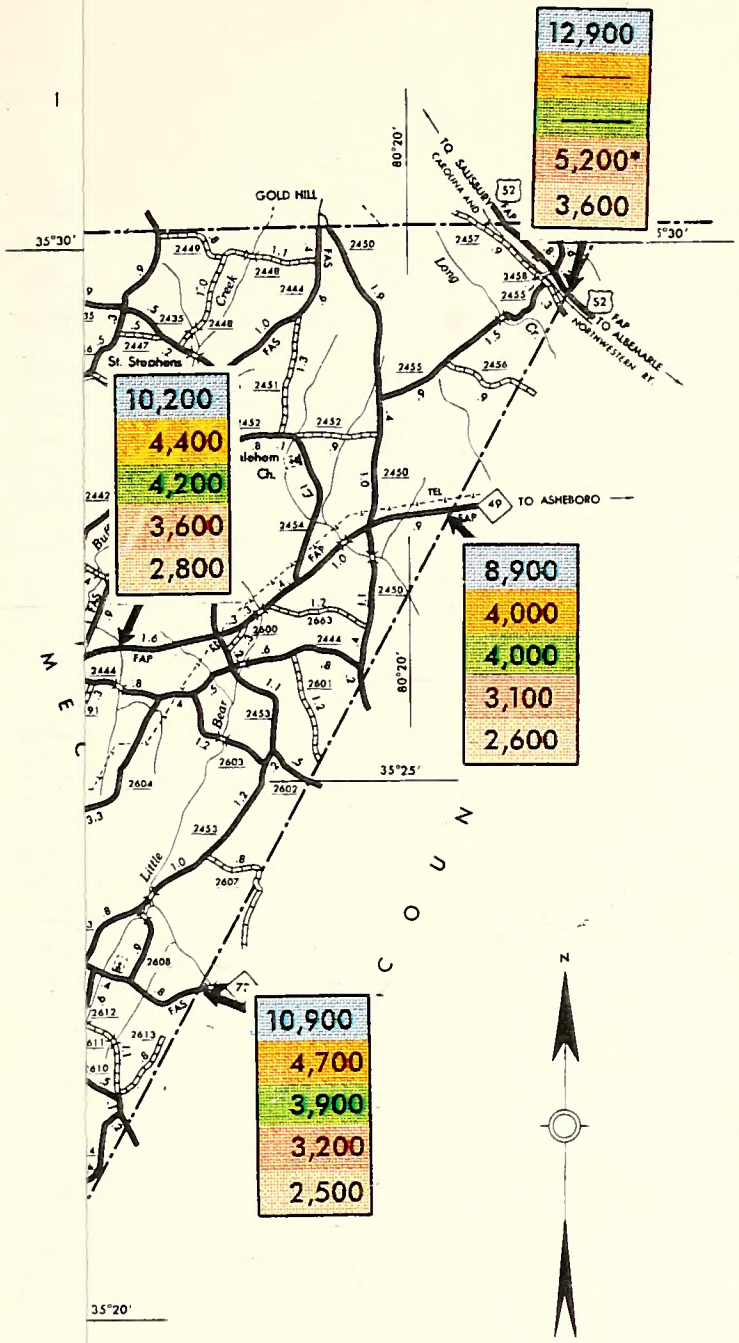
transition from a non-automobile oriented society to one whose vitality is heavily dependent on the automobile. This change in lifestyle has gradually occurred over many years, with the most dramatic difference being between 1940 and 1960. This is primarily due to: the post-depression increase in the standard of living; the increase in population including the post World War II "Baby Boom"; the transition from an agriculturally dominated society to a more diversified one (fewer people on the farm, greater need for transportation); and the availability of automobiles in the 1960's and 1970's combined the banking credit to buy them.

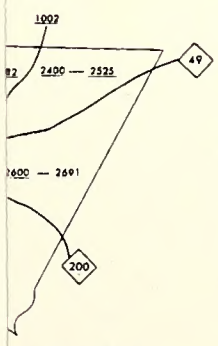
Since the 1970's, the reasons for purchasing more automobiles have had less influence and have led to the expectation that the person-per-vehicle rate will begin to stabilize as projected in **Figure 5.** This saturation effect is expected to stabilize trip-making characteristics of middle and upper income families. They already have the financial means to purchase enough vehicles to satisfy their transportation needs. On the other hand, moderate growth in the trip-making characteristics of lower income families is projected due to an expected improvement in their financial well-being.

Table B1 and B2 in Appendix B lists the persons per vehicle rate for Cabarrus County and North Carolina from 1940 to 2010. The projected population values for the year 2000 and 2010 were supplied by North Carolina State Data Center.

B. Traffic Accidents

Locations with 15 or more accidents in a three year period, or where accident severity or property damage is considerably higher than average, are called significant high accident locations. There was only one such location in the rural section of Cabarrus County over the three year period from January, 1991 to December, 1993. Some of the problems characteristic with high accident locations include: inadequate design, poor sight distance, high traffic volume, etc. In addition, there were four locations with 10-14 accidents during the period, and a total of 31 locations with five or more accidents. **Figure 6** shows high accident locations for Cabarrus County and North Carolina.





TY ROAD NUMBERS

UDES ONLY STATE MAINTAINED ROADS
RTANT NON-SYSTEM ROADS.
NOT SHOWN ON FRONTAGE ROADS.

## LEGEND

- PRIMITIVE OR UNIMPROVED ROAD
- GRADED AND DRAINED ROAD
- SOIL, GRAVEL OR STONE SURFACED ROAD
- HARD SURFACED ROAD
- 4 LANE UNDIVIDED HIGHWAY
- DIVIDED HIGHWAY
- HIGHWAY WITH FRONTAGE ROADS
- FCA — FULL CONTROL ACCESS
- FAI — FEDERAL AID INTERSTATE ROAD
- FAP — FEDERAL AID PRIMARY ROAD
- FAS — FEDERAL AID SECONDARY ROAD
- FAU — FEDERAL AID URBAN
- NS — NON-SYSTEM ROAD
- FAP — PROJECTED LOCATION
- 4 — INTERSECTION DISTANCE
- TRAFFIC CIRCLE
- HIGHWAY INTERCHANGE
- DETAILED HIGHWAY INTERCHANGE
- 40 — INTERSTATE HIGHWAY
- 70 — U.S. NUMBERED HIGHWAY
- 1 FAP — U. S. NUMBERED BICYCLE ROUTE
- 42 — N.C. NUMBERED HIGHWAY
- N.C. NUMBERED BICYCLE ROUTE
- 207 — INTERSTATE INTERCHANGE NUMBER
- 1100 — SECONDARY ROAD NUMBER
- TEL — UNDERGROUND CABLE
- RAILROAD, ANY NUMBER OF TRACKS USED BY SINGLE OPERATING COMPANY
- RAILROAD, ANY NUMBER OF TRACKS USED BY MORE THAN ONE OPERATING COMPANY ON SAME OR ADJACENT RIGHTS-OF-WAY
- RAILROAD STATION
- GRADE CROSSING
- UNDERPASS
- OVERPASS
- RAILROAD TUNNEL
- ARMY, NAVY, OR MARINE CORPS FIELD
- COMM. OR MUNICIPAL AIRPORT
- MARKED AUXILIARY FIELD
- HANGAR ON FIELD ("B" IN SYMBOL)
- FREE OR TOLL FERRY
- LIGHTHOUSE
- COAST GUARD STATION
- CANAL
- NARROW STREAM
- WIDE STREAM
- DAM WITH LOCK
- DAM
- RESERVOIR, POND, OR LAKE
- 5763 — PROMINENT PEAK, NUMERALS INDICATE ELEVATION
- ROAD THROUGH MOUNTAIN PASS
- HIGHWAY BRIDGE, OVER 20 FT.
- DRAW SPAN ON BRIDGE
- HIGHWAY TUNNEL
- FORD
- STATE LINE
- COUNTY LINE
- CITY LIMITS
- RESERVATION OR PARK BOUNDARY
- INSET AREA
- UNINCORPORATED CENSUS DESIGNATED PLACE
- COUNTY SEAT
- OTHER TOWNS AND VILLAGES
- TRIANGULATION STATION
- INCORPORATED CITY OR VILLAGE, (GENERALIZED)
- SCHOOL
- CHURCH
- CHURCH WITH CEMETERY
- CEMETERY
- HOSPITAL
- CORRECTIONAL OR PENAL INSTN
- HIGHWAY GARAGE OR MAINT. YARD
- HIGHWAY DIV. OR DIST. OFFICE
- WEIGHT STATION
- PATROL STATION
- REST AREA
- MONUMENT — SMALL HISTORICAL SITE

# HISTORIC AND PROJECTED ADT VOLUMES

## LEGEND

| | |
|---|---|
| 2020 | ADT |
| 1990 | ADT |
| 1986 | ADT |
| 1980 | ADT |
| 1976 | ADT |

* = 1983 count

URBAN PLANNING AREA BOUNDARY

# CABARRUS COUNTY

## NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4

SCALE IN MILES

BASE: 1992

FIGURE 4

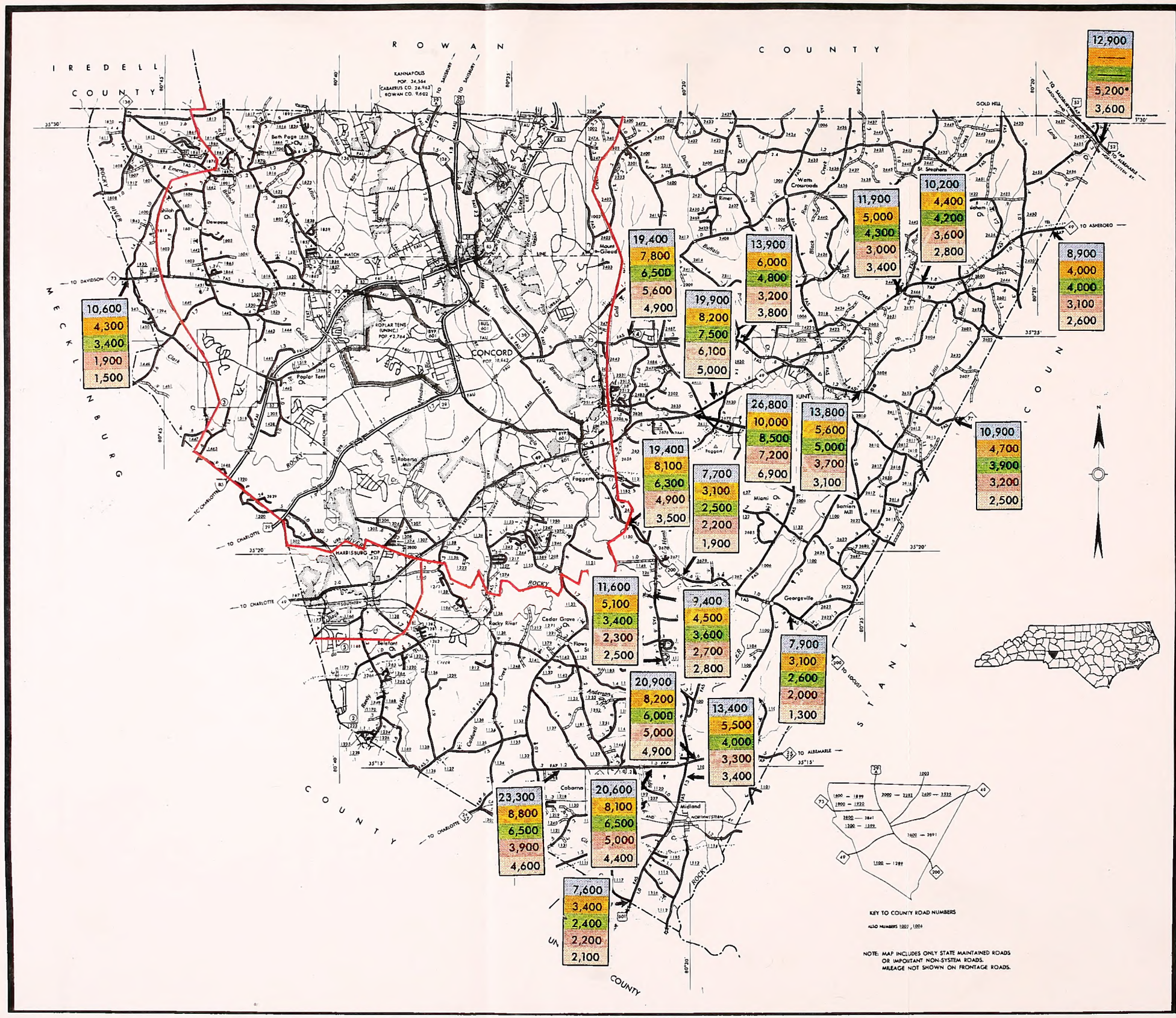
transition from a non-automobile oriented society to one whose vitality is heavily dependent on the automobile. This change in lifestyle has gradually occurred over many years, with the most dramatic difference being between 1940 and 1960. This is primarily due to: the post-depression increase in the standard of living; the increase in population including the post World War II "Baby Boom"; the transition from an agriculturally dominated society to a more diversified one (fewer people on the farm, greater need for transportation); and the availability of automobiles in the 1960's and 1970's combined the banking credit to buy them.

Since the 1970's, the reasons for purchasing more automobiles have had less influence and have led to the expectation that the person-per-vehicle rate will begin to stabilize as projected in **Figure 5.** This saturation effect is expected to stabilize trip-making characteristics of middle and upper income families. They already have the financial means to purchase enough vehicles to satisfy their transportation needs. On the other hand, moderate growth in the trip-making characteristics of lower income families is projected due to an expected improvement in their financial well-being.

Table B1 and B2 in Appendix B lists the persons per vehicle rate for Cabarrus County and North Carolina from 1940 to 2010. The projected population values for the year 2000 and 2010 were supplied by North Carolina State Data Center.

B. Traffic Accidents

Locations with 15 or more accidents in a three year period, or where accident severity or property damage is considerably higher than average, are called significant high accident locations. There was only one such location in the rural section of Cabarrus County over the three year period from January, 1991 to December, 1993. Some of the problems characteristic with high accident locations include: inadequate design, poor sight distance, high traffic volume, etc. In addition, there were four locations with 10-14 accidents during the period, and a total of 31 locations with five or more accidents. **Figure 6** shows high accident locations for Cabarrus County and North Carolina.




LEGEND

- PRIMITIVE OR UNIMPROVED ROAD
- GRADED AND DRAINED ROAD
- SOIL, GRAVEL OR STONE SURFACED ROAD
- HARD SURFACED ROAD
- 4 LANE UNDIVIDED HIGHWAY
- DIVIDED HIGHWAY
- HIGHWAY WITH FRONTAGE ROADS
- FCA FULL CONTROL ACCESS
- FAI FEDERAL AID INTERSTATE ROAD
- FAP FEDERAL AID PRIMARY ROAD
- FAS FEDERAL AID SECONDARY ROAD
- FAU FEDERAL AID URBAN
- NS NON-SYSTEM ROAD
- IAP PROJECTED LOCATION
- INTERSECTION DISTANCE
- TRAFFIC CIRCLE
- HIGHWAY INTERCHANGE
- DETAILED HIGHWAY INTERCHANGE
- 40 INTERSTATE HIGHWAY
- 70 U.S. NUMBERED HIGHWAY
- U.S. NUMBERED BICYCLE ROUTE
- 42 N.C. NUMBERED HIGHWAY
- N.C. NUMBERED BICYCLE ROUTE
- 85T INTERSTATE INTERCHANGE NUMBER
- 1100 SECONDARY ROAD NUMBER
- UNDERGROUND CABLE
- RAILROAD, ANY NUMBER OF TRACKS USED BY SINGLE OPERATING COMPANY
- RAILROAD, ANY NUMBER OF TRACKS USED BY MORE THAN ONE OPERATING COMPANY ON SAME OR ADJACENT RIGHTS-OF-WAY
- RAILROAD STATION
- GRADE CROSSING
- UNDERPASS
- OVERPASS
- RAILROAD TUNNEL
- ARMY, NAVY, OR MARINE CORPS FIELD
- COMM. OR MUNICIPAL AIRPORT
- MARKED AUXILIARY FIELD
- HANGAR ON FIELD ("B" IN SYMBOL)
- FREE OR TOLL FERRY
- LIGHTHOUSE
- COAST GUARD STATION
- CANAL
- NARROW STREAM
- WIDE STREAM
- DAM WITH LOCK
- DAM
- RESERVOIR, POND, OR LAKE
- 5763 PROMINENT PEAK, NUMBERALS INDICATE ELEVATION
- ROAD THROUGH MOUNTAIN PASS
- HIGHWAY BRIDGE OVER 20 FT.
- DRAW SPAN ON BRIDGE
- HIGHWAY TUNNEL
- FORD
- STATE LINE
- COUNTY LINE
- CITY LIMITS
- RESERVATION OR PARK BOUNDARY
- INSET AREA
- UNINCORPORATED CENSUS DESIGNATED PLACE
- COUNTY SEAT
- OTHER TOWNS AND VILLAGES
- TRIANGULATION STATION
- INCORPORATED CITY OR VILLAGE (GENERALIZED)
- SCHOOL
- CHURCH
- CHURCH WITH CEMETERY
- CEMETERY
- HOSPITAL
- CORRECTIONAL OR PENAL INSTN
- HIGHWAY GARAGE OR MAINT. YARD
- HIGHWAY DIV. OR DIST. OFFICE
- WEIGHT STATION
- PATROL STATION
- REST AREA
- MONUMENT – SMALL HISTORICAL SITE

# HISTORIC AND PROJECTED ADT VOLUMES

LEGEND

| | |
|---|---|
| 2020 | ADT |
| 1990 | ADT |
| 1986 | ADT |
| 1980 | ADT |
| 1976 | ADT |

* = 1983 count

URBAN PLANNING AREA BOUNDARY

# CABARRUS COUNTY

## NORTH CAROLINA

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4
SCALE IN MILES

BASE: 1992

FIGURE 4

# PERSONS/VEHICLE
## CABARRUS COUNTY & NORTH CAROLINA

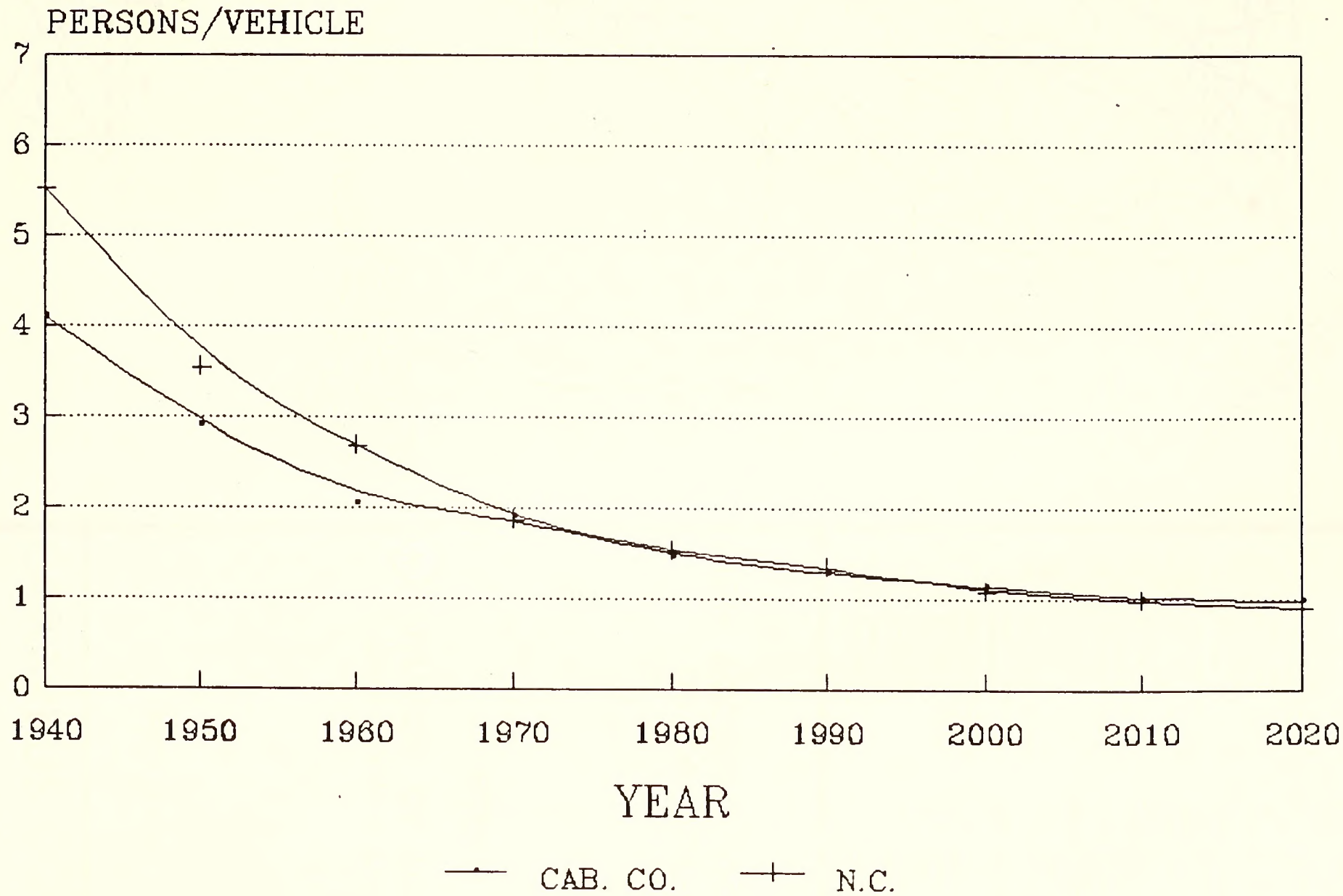
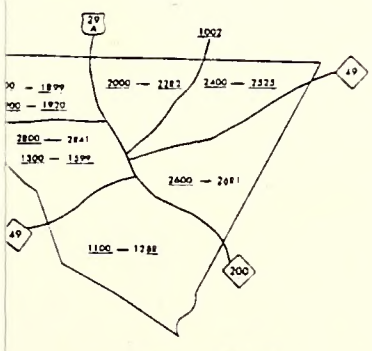



FIGURE 5




KEY TO COUNTY ROAD NUMBERS

ALSO NUMBERS 1002, 1006

NOTE: MAP INCLUDES ONLY STATE MAINTAINED ROADS OR IMPORTANT NON-SYSTEM ROADS. MILEAGE NOT SHOWN ON FRONTAGE ROADS.

## LEGEND

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- 4 LANE UNDIVIDED HIGHWAY
- DIVIDED HIGHWAY
- HIGHWAY WITH FRONTAGE ROADS
- FCA — FULL CONTROL ACCESS
- FAI — FEDERAL AID INTERSTATE ROAD
- FAP — FEDERAL AID PRIMARY ROAD
- FAS — FEDERAL AID SECONDARY ROAD
- FAU — FEDERAL AID URBAN
- NS — NON-SYSTEM ROAD
- PAP — PROJECTED LOCATION
- INTERSECTION DISTANCE
- TRAFFIC CIRCLE
- HIGHWAY INTERCHANGE
- DETAILED HIGHWAY INTERCHANGE
- 40 — INTERSTATE HIGHWAY
- 70 — U.S. NUMBERED HIGHWAY
- 1 — U.S. NUMBERED BICYCLE ROUTE
- A2 — N.C. NUMBERED HIGHWAY
- N.C. NUMBERED BICYCLE ROUTE
- 80F — INTERSTATE INTERCHANGE NUMBER
- 1100 — SECONDARY ROAD NUMBER
- TEL — UNDERGROUND CABLE
- RAILROAD, ANY NUMBER OF TRACKS USED BY SINGLE OPERATING COMPANY
- RAILROAD, ANY NUMBER OF TRACKS USED BY MORE THAN ONE OPERATING COMPANY ON SAME OR ADJACENT RIGHTS-OF-WAY
- RAILROAD STATION
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- OVERPASS
- RAILROAD TUNNEL
- ARMY, NAVY, OR MARINE CORPS FIELD
- COMM. OR MUNICIPAL AIRPORT
- MARKED AUXILIARY FIELD
- HANGAR ON FIELD ("B" IN SYMBOL)
- FREE OR TOLL FERRY
- LIGHTHOUSE
- COAST GUARD STATION
- CANAL
- NARROW STREAM
- WIDE STREAM
- DAM WITH LOCK
- DAM
- RESERVOIR, POND, OR LAKE
- 9783 — PROMINENT PEAK, NUMERALS INDICATE ELEVATION
- ROAD THROUGH MOUNTAIN PASS
- HIGHWAY BRIDGE OVER 20 FT.
- DRAW SPAN ON BRIDGE
- HIGHWAY TUNNEL
- FORD
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- COUNTY LINE
- CITY LIMITS
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- HIGHWAY GARAGE OR MAINT. YARD
- HIGHWAY DIV. OR DIST. OFFICE
- WEIGHT STATION
- PATROL STATION
- REST AREA
- MONUMENT — SMALL HISTORICAL SITE

# HIGH ACCIDENT LOCATIONS (10 OR MORE)

## LEGEND

(#) – NUMBER OF ACCIDENTS (JAN., 1991 – DEC., 1993)

FIGURE 6

# CABARRUS COUNTY

## NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH

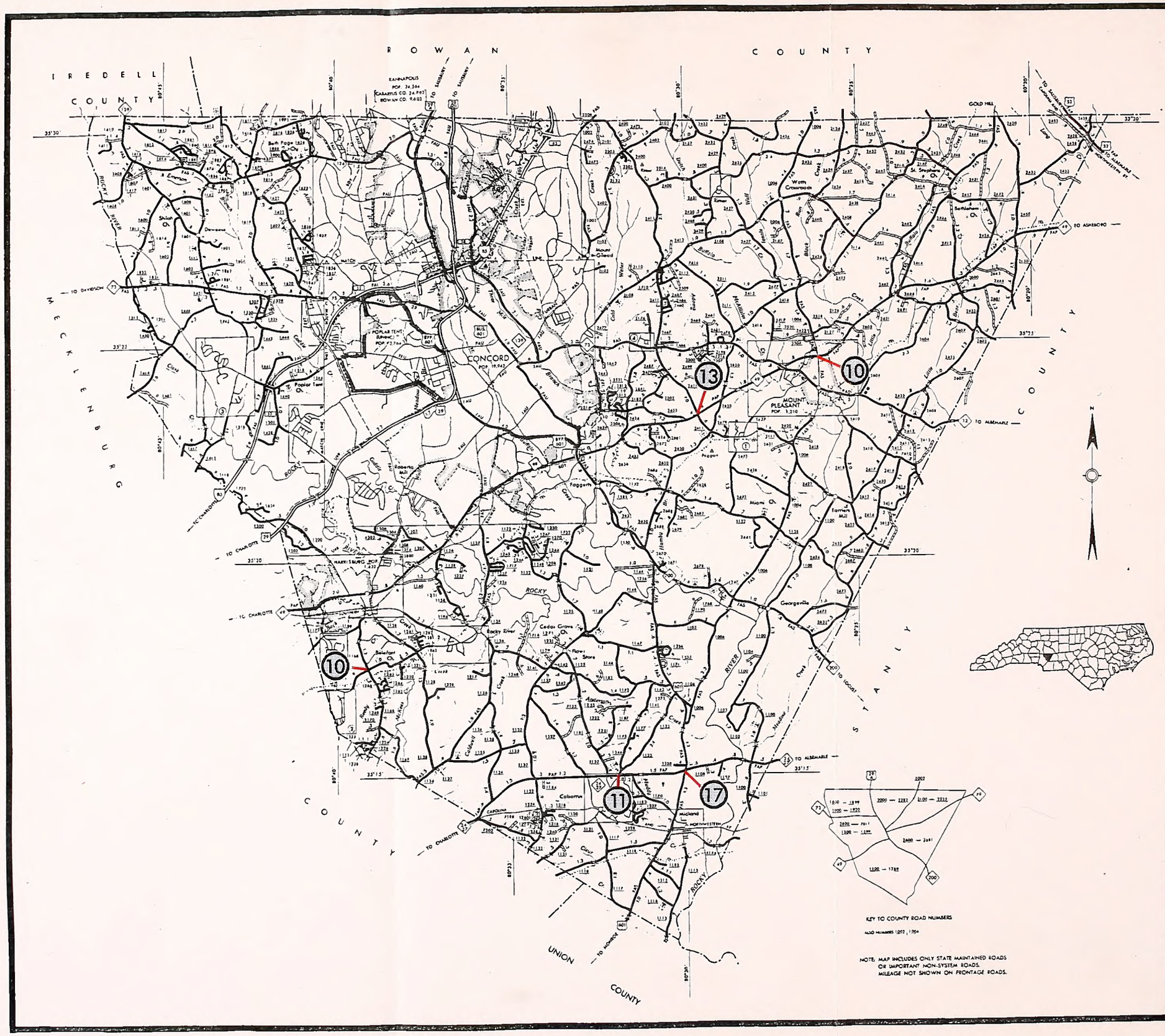
U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4

SCALE IN MILES

BASE: 1992




LEGEND

PRIMITIVE OR UNIMPROVED ROAD
GRADED AND DRAINED ROAD
SOIL, GRAVEL OR STONE SURFACED ROAD
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4 LANE UNDIVIDED HIGHWAY
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INTERSECTION DISTANCE
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HIGHWAY TUNNEL
FORD
STATE LINE
COUNTY LINE
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BUILT AREA
UNINCORPORATED CENSUS DESIGNATED PLACE
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HIGHWAY GARAGE OR MAINT. YARD
HIGHWAY DIV. OR DIST. OFFICE
WEIGHT STATION
PATROL STATION
REST AREA
MONUMENT – SMALL HISTORICAL SITE

# HIGH ACCIDENT LOCATIONS (10 OR MORE)

LEGEND

(#) – NUMBER OF ACCIDENTS (JAN., 1991 – DEC., 1993)

FIGURE 6

# CABARRUS COUNTY

NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4
SCALE IN MILES

BASE: 1992

# VI. DEFICIENCY ANALYSIS

## A. Capacity

A good indication of the adequacy of an existing major street system is a comparison of the traffic volumes with the ability of the streets to move traffic freely at a desirable speed. The ability of a street to move traffic freely, safely, and efficiently with a minimum delay is controlled principally by the spacing of major traffic devices. Thus, the ability of a street to move traffic can be increased by restricting parking and turning movements. This can be accomplished by using proper sign and signal devices, and by the application of other traffic engineering techniques.

Capacity is defined as the maximum number of vehicles that have a reasonable expectation of passing over a given section of a roadway in one direction, or in both directions, during a given period under prevailing roadway and traffic conditions. [1] The relationship of traffic volumes to the capacity of the roadway will determine the **level of service (LOS)** being provided. **Figure 7** shows the levels of congestion associated with the various levels of service. A brief description of each level of service in accordance with the 1985 Highway Capacity Manual is discussed in Chapter V.

The recommended improvements and overall design of the Thoroughfare Plan were based on achieving a minimum of LOS D on existing facilities, and LOS C on new facilities. LOS D is considered the **"practical capacity"** of a facility, or that at which the public begins to express dissatisfaction. LOS E is the maximum carrying capacity of a facility.

The road network in Cabarrus County was analyzed to determine if the existing roads were able to handle the existing traffic. The process calls for the comparison of volume to capacity ratios. The capacity of a particular road is dependant on levels of service (operating speeds) and pavement width. When the existing volumes for roads outside of urban areas were compared to those capacities, it was found that the following road was considered to be over-capacity.

- NC 49 from Harrisburg to Red Angus Road (SR 2633)
  (See TIP# R-2533 for improvements)

Additional analysis of roads in Cabarrus County was made to determine if projected traffic (for the year 2020) would exceed the practical capacity of the system. Comparing projected traffic to available capacities (capacity is determined at LOS D), it is anticipated that the following roads will be experiencing capacity related problems within the design period if no improvements are made:

---

[1] Highway Capacity manual, Special Report 209, 1985, p. 1-3.

- US 52 from Rowan County to Stanly County
  (See TIP# R-2903 for improvements)
- NC 49 from Harrisburg to Mount Pleasant
  (See TIP# R-2533 for improvements)
- NC 24/27 from Stanly County to Mecklenburg County
  (See TIP# R-615 & R-2104 for improvements)
- NC 73 from Mecklenburg County to the KANLACON MAB
- NC 73 from KANLACON MAB to Stanly County
  (See TIP# R-2410 for improvements)
- US 601 from KANLACON MAB to Union County
- SR 1006 from Rowan County to US 601

B. Design Characteristics

The North Carolina standards for highway construction call for 11-foot lanes on all highways with traffic volumes greater than 2000 ADT (average daily traffic) or design speeds greater than 50 miles per hour. This includes all primary arterials. A minimum lane width of nine feet can be tolerated on collector roads with an ADT of less than 400 vehicles per day (see discussion on minimum tolerable lane widths, page VI-7). The minimum level of service for minor collector roads dictates a 40 mph design speed during peak traffic conditions. For an outline of all functionally classified facilities in rural Cabarrus County that do not meet North Carolina Standards, see appendix A. (Ref: NCDOT)

Design requirements for thoroughfares vary according to the desired capacity and level of service to be provided. Universal standards in the design of thoroughfares are not practical. Each road or highway section must be individually analyzed. Its design requirements will be determined by the amount and type of projected traffic, existing capacity, desired level of service, and available right of way.

The level of service is a function of the ease of movement experienced by motorists using the facility. The ability of a motorist to drive at a desired speed is dependent upon many factors. Included are the physical design of the road, the amount and character of traffic control devices, the influence and character of traffic generated by abutting property, and the imposed speed restrictions. The level of service is indicated by the overall travel speed experienced by traffic. Ideal average travel speeds for roads and highways included in the proposed Cabarrus County Thoroughfare Plan are given in Table 5.

Table 5
**Ideal Average Travel Speeds for Roads and Highways**

| Facility | Overall Travel Speed During Peak Travel Conditions |
|---|---|
| Major and Minor Arterials | 50-55 MPH |
| Major Collector Roads | 45-50 MPH |
| Minor Collector Roads | 40 MPH |

## C. Levels of Service

The concept of levels of service is defined as a qualitative measure describing operating conditions within a traffic stream, and their perception by motorists and/or passengers. A level-of-service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. (Ref. NCDOT & Highway Capacity Manual)

Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations, from A to F, with level-of-service A representing the best operating conditions and level-of-service F the worst.

1. Level-of-Service definitions - The various levels of service are defined as follows for uninterrupted flow facilities:

   Level-of-Service A represents free flow. Individual users are unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.

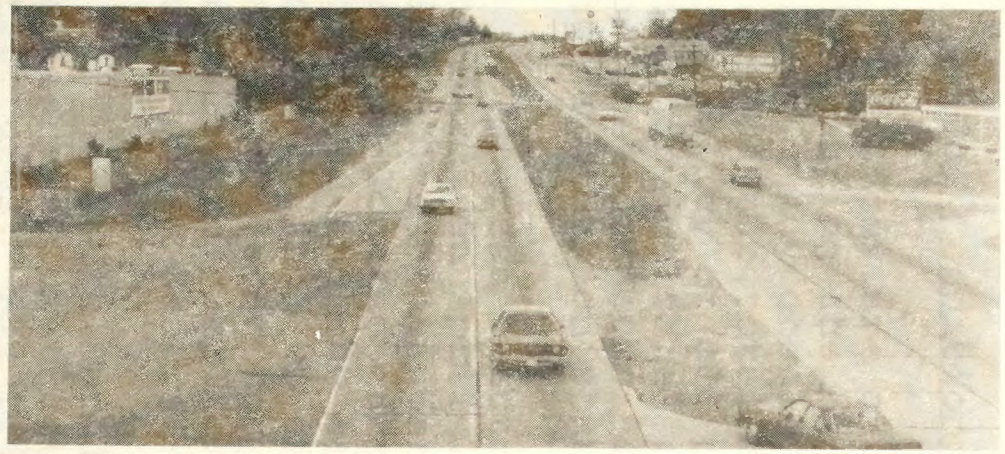
   Level-of-Service B is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior.

   Level-of-Service C is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this point.

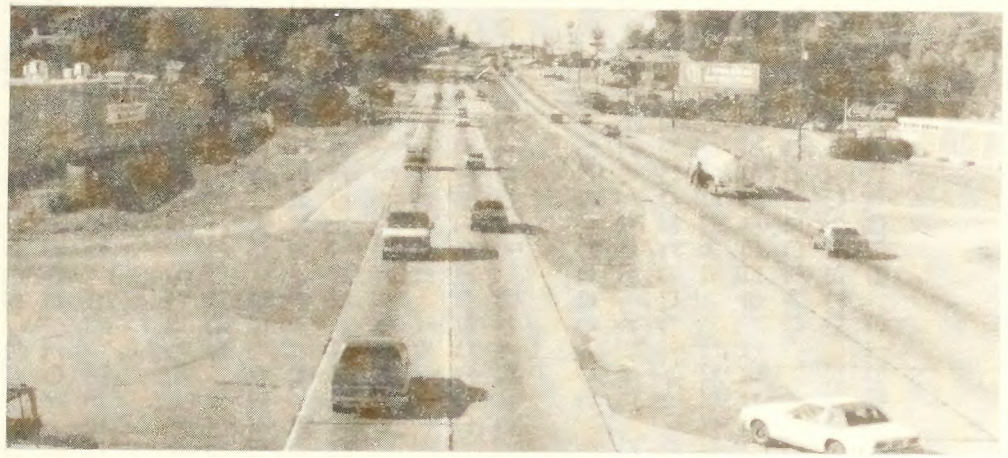
   Level-of-Service D represents high-density, but stable, flow. Speed and freedom to maneuver are restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

   Level-of-Service E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

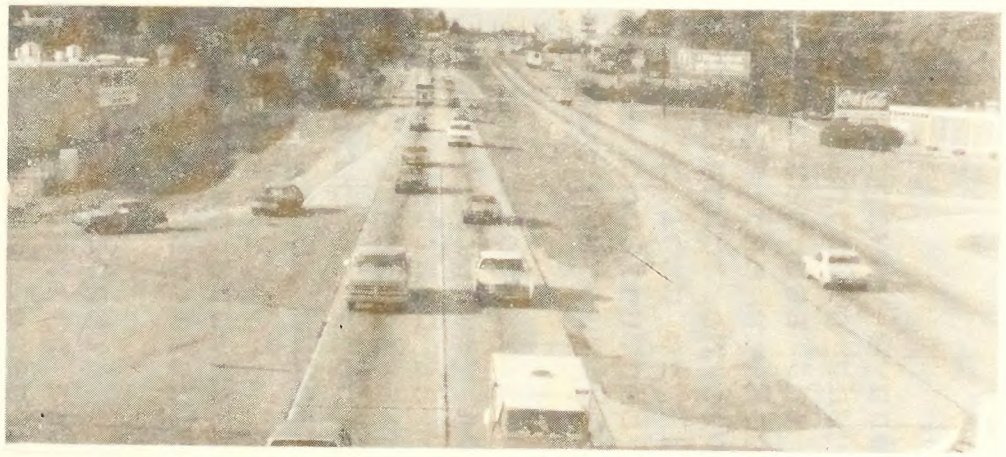
Level-of-Service F is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount that can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level-of-service F is used to describe the operating conditions within the queue, as well as the point of breakdown. It should be noted, however, that in many cases operating conditions of vehicles or pedestrians discharged from the queue may be good. It is the point at which arrival flow exceeds discharge flow which causes the queue to form, and level-of-service F is an appropriate designation for such points.



LEVEL OF SERVICE - A



LEVEL OF SERVICE - B



LEVEL OF SERVICE - C

LEVEL OF SERVICE - D

LEVEL OF SERVICE - E

LEVEL OF SERVICE - F

LEVELS OF SERVICE

FIGURE 7

For driver convenience, ease of operations, and safety, it would be desirable to widen all existing roads and highways to provide a minimum lane width of 12 feet. However, when considering overall statewide needs and the available highway revenue, it is found that this level of improvement applied statewide would be impractical. Therefore, it is necessary to establish minimum tolerable widths for existing roads with respect to traffic demands and economic feasibility. The established widths used in determining lane deficiencies are given in Table 6.

There are a number of major roads in the County that have substandard widths. (see Chapter VII - Recommendations) The standards shown in Table 6 were used in analyzing these roads. The cross-section needed to improve each road to standard is given in the Thoroughfare Plan Street Tabulation and Recommendations in Appendix A. Because of the substantial cost of upgrading all secondary roads to standard, narrow widths may have to be tolerated until sufficient funds are available for improvements.

Table 6
**Minimum Tolerable Lane Widths**

| ADT | Principal Arterials | Minor Arterials | Collectors |
|---|---|---|---|
| below 100 | - | - | 9 |
| 100 - 400 | - | 10 | 9 |
| 400 - 2,000 | - | 10 | 10 |
| over 2,000 | 11 | 11 | 11 |

** North Carolina Standards for highway construction **

D. Bridge Conditions

Bridges are a vital and unique element of the highway system, representing the highest unit investment of all elements in the system. Any obsolescence or deficiency in a bridge reduces the value of the total system. A bridge failure presents the greatest possibility of all potential highway failures for disruption of community welfare, and most importantly, of injury or loss of life. For these reasons, it is imperative that bridges be constructed to the same design standards as the rest of the highway system.

Congress enacted the National Bridge Inspection Program Standards on April 27, 1971, implementing the Federal Highway Act of 1968. These standards require that "all structures defined as bridges located on any of the Federal-Aid Highway Systems be inspected and the safe load carrying capacity computed at regular intervals, not to exceed two years." A sufficiency index number has been calculated for each bridge to establish eligibility and priority for replacement. The bridges with the highest priority are replaced as Federal-Aid funds and State funds are made available.

The North Carolina Department of Transportation Bridge Maintenance unit set forth standards for evaluating existing bridge structures. All bridges in Cabarrus County have been analyzed, rated, appraised, and inventoried, and the resulting data has been reduced to a more readily useable form as a management tool.

A sufficiency rating was used in the analysis to determine the deficiency of each bridge. The sufficiency rating is a method of evaluating factors that determine whether a bridge is sufficient to remain in service. Factors used include: structural adequacy and safety, serviceability and functional obsolescence, essentiality for public use, type of structure, and traffic safety features. The result of this method is a percentage in which 100 % represents an entirely sufficient bridge and zero percent represents an entirely insufficient or deficient bridge. A sufficiency rating of 50 % or less qualifies for Federal Bridge Replacement Funds.

The two different classifications for bridges in need of rehabilitation are as follows:

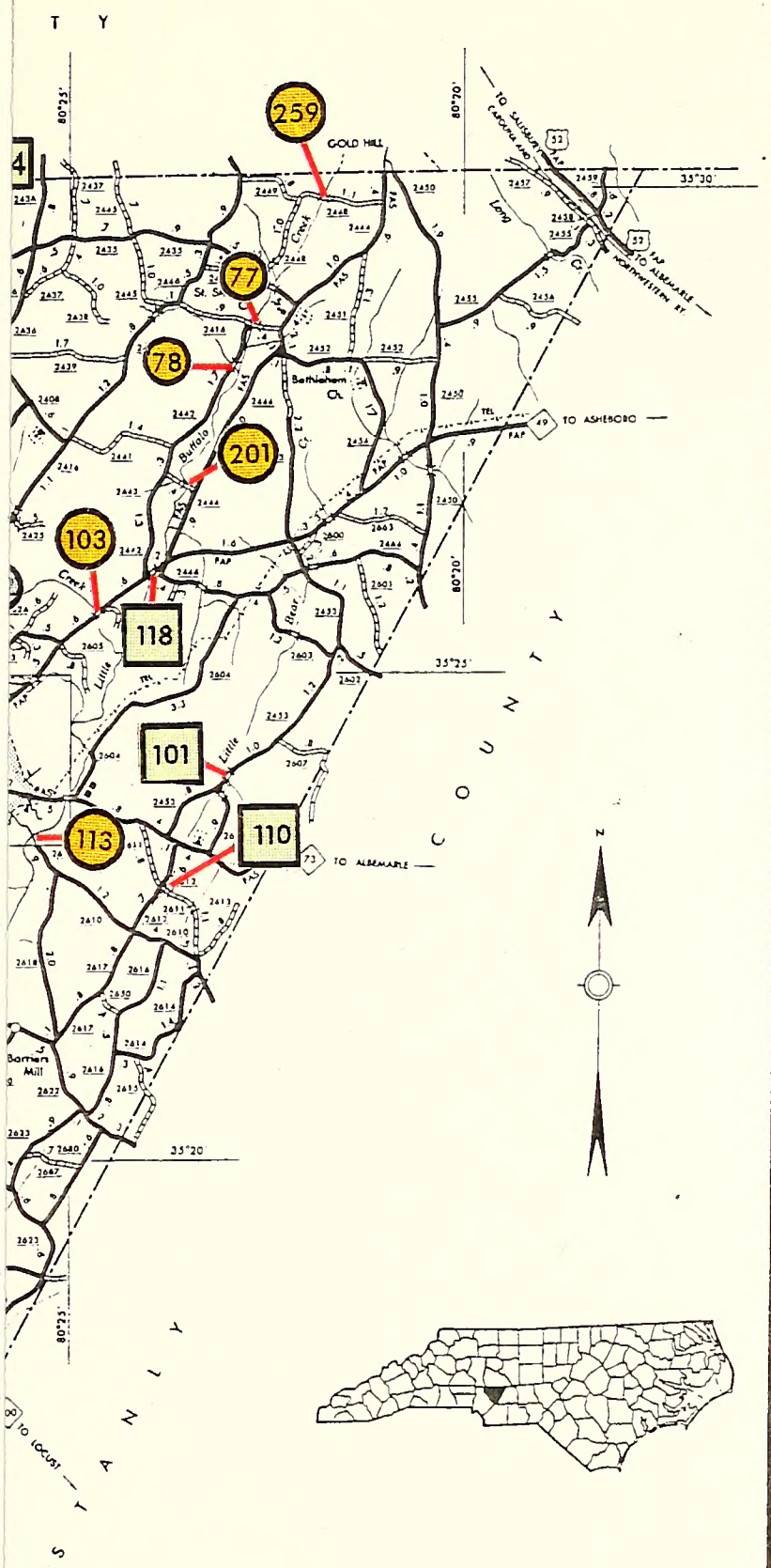
Structurally Deficient: Condition rating of 4 or less for either of the following:
- Deck Superstructure
- Substructure

OR

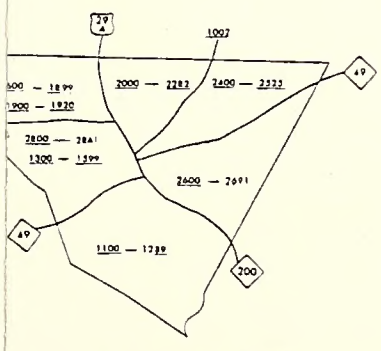
An appraisal rating of 2 or less for either of the following:
- Structural Condition
- Waterway Adequacy

Functionally Obsolete: An appraisal rating of 3 or less in either of the following:
- Structural condition
- Waterway adequacy
- Deck Geometry
- Under Clearance
- Approach Roadway Alignment

Tables 7 and 8 show structurally deficient bridges and functionally obsolete bridges with sufficiency ratings of 50 percent or less. Only those bridges with ratings of 50 percent or less are eligible for federal bridge replacement funds. The locations of these bridges are in **Figure 8.**






KEY TO COUNTY ROAD NUMBERS

ALSO NUMBERS 1003, 1004

NOTE: MAP INCLUDES ONLY STATE MAINTAINED ROADS OR IMPORTANT NON-SYSTEM ROADS. MILEAGE NOT SHOWN ON FRONTAGE ROADS.

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- N.C. NUMBERED BICYCLE ROUTE
- 407 — INTERSTATE INTERCHANGE NUMBER
- 1100 — SECONDARY ROAD NUMBER
- TEL — UNDERGROUND CABLE
- RAILROAD, ANY NUMBER OF TRACKS USED BY SINGLE OPERATING COMPANY
- RAILROAD, ANY NUMBER OF TRACKS USED BY MORE THAN ONE OPERATING COMPANY ON SAME OR ADJACENT RIGHTS-OF-WAY
- RAILROAD STATION
- GRADE CROSSING
- UNDERPASS
- OVERPASS
- RAILROAD TUNNEL
- ARMY, NAVY, OR MARINE CORPS FIELD
- COMM. OR MUNICIPAL AIRPORT
- MARKED AUXILIARY FIELD
- HANGAR ON FIELD ("S" IN SYMBOL)
- FREE OR TOLL FERRY
- LIGHTHOUSE
- COAST GUARD STATION
- CANAL
- NARROW STREAM
- WIDE STREAM
- DAM WITH LOCK
- DAM
- RESERVOIR, POND, OR LAKE
- 5783 — PROMINENT PEAK, NUMERALS INDICATE ELEVATION
- ROAD THROUGH MOUNTAIN PASS
- HIGHWAY BRIDGE, OVER 20 FT
- DRAW SPAN ON BRIDGE
- HIGHWAY TUNNEL
- FORD
- STATE LINE
- COUNTY LINE
- CITY LIMITS
- RESERVATION OR PARK BOUNDARY
- INSET AREA
- UNINCORPORATED CENSUS DESIGNATED PLACE
- COUNTY SEAT
- OTHER TOWNS AND VILLAGES
- TRIANGULATION STATION
- INCORPORATED CITY OR VILLAGE (GENERALIZED)
- SCHOOL
- CHURCH
- CHURCH WITH CEMETERY
- CEMETERY
- HOSPITAL
- CORRECTIONAL OR PENAL INSTN
- HIGHWAY GARAGE OR MAINT. YARD
- HIGHWAY DIV. OR DIST. OFFICE
- WEIGHT STATION
- PATROL STATION
- REST AREA
- MONUMENT — SMALL HISTORICAL SITE

# STRUCURALLY DEFICIENT AND FUNCTIONALLY OBSOLETE BRIDGES

FIGURE 8

# CABARRUS COUNTY

## NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4

SCALE IN MILES

BASE: 1992

A sufficiency rating was used in the analysis to determine the deficiency of each bridge. The sufficiency rating is a method of evaluating factors that determine whether a bridge is sufficient to remain in service. Factors used include: structural adequacy and safety, serviceability and functional obsolescence, essentiality for public use, type of structure, and traffic safety features. The result of this method is a percentage in which 100 % represents an entirely sufficient bridge and zero percent represents an entirely insufficient or deficient bridge. A sufficiency rating of 50 % or less qualifies for Federal Bridge Replacement Funds.

The two different classifications for bridges in need of rehabilitation are as follows:

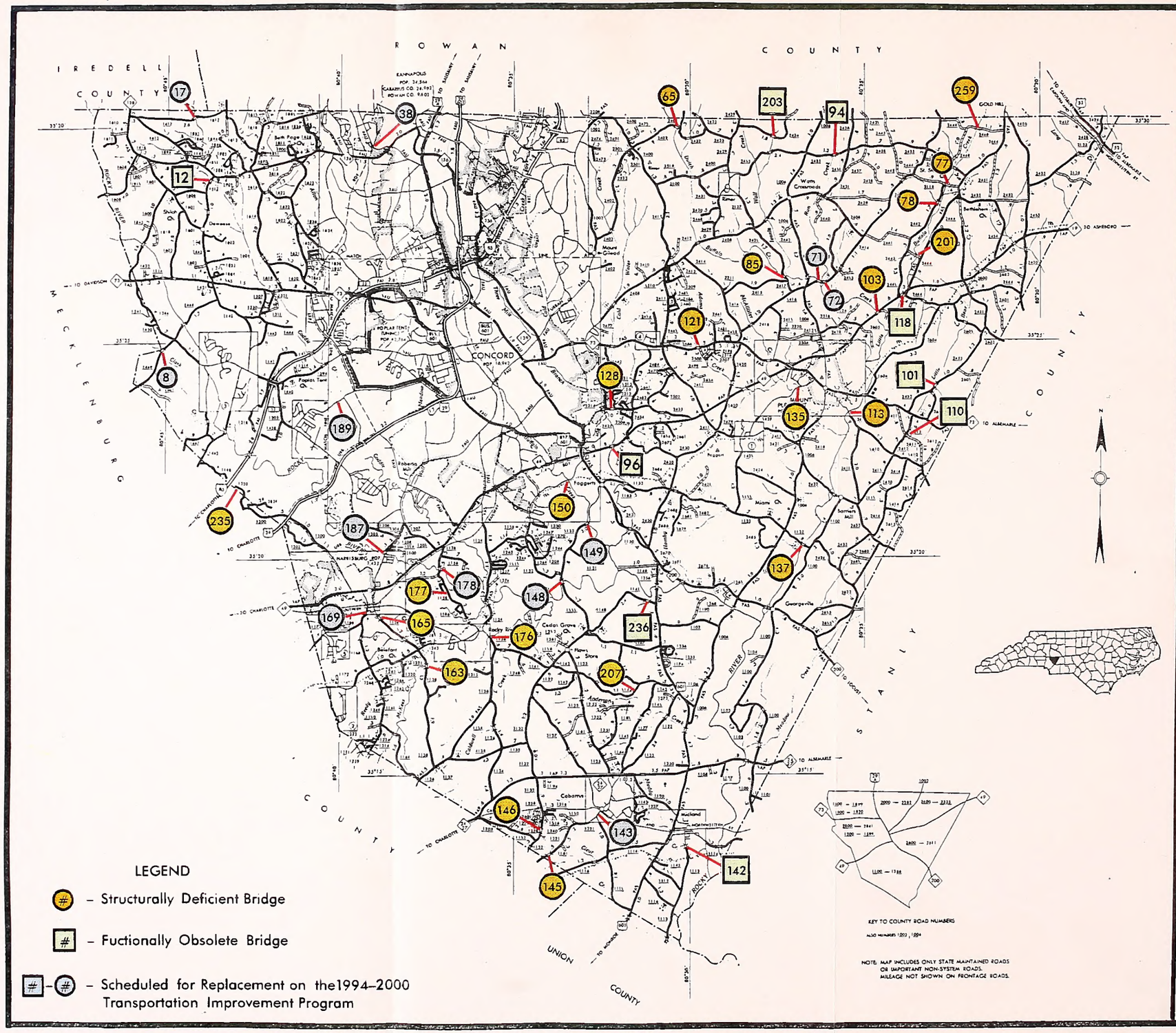
Structurally Deficient: Condition rating of 4 or less for either of the following:
- Deck Superstructure
- Substructure

OR

An appraisal rating of 2 or less for either of the following:
- Structural Condition
- Waterway Adequacy

Functionally Obsolete: An appraisal rating of 3 or less in either of the following:
- Structural condition
- Waterway adequacy
- Deck Geometry
- Under Clearance
- Approach Roadway Alignment

Tables 7 and 8 show structurally deficient bridges and functionally obsolete bridges with sufficiency ratings of 50 percent or less. Only those bridges with ratings of 50 percent or less are eligible for federal bridge replacement funds. The locations of these bridges are in **Figure 8.**




LEGEND

STRUCURALLY DEFICIENT AND FUNCTIONALLY OBSOLETE BRIDGES

FIGURE 8

# CABARRUS COUNTY

## NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH
IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4
SCALE IN MILES

BASE: 1992

**TABLE 7**

**Structurally Deficient Bridges in Cabarrus County**

| Rank | Sufficiency Rating | Bridge No. | Features Intersected |
|---|---|---|---|
| 1 | 14.9 | * 148 | SR 1132 @ ROCKY RIVER |
| 2 | 15.4 | 47 | SR 1002 @ 3 MILE BRANCH |
| 3 | 17.6 | * 187 | SR 1304 @ ROCKY RIVER |
| 4 | 18.3 | 235 | SR 1520 @ BR. OF ROCKY RIV |
| 5 | 20.0 | * 17 | SR 1612 @ CODDLE CREEK |
| 6 | 21.6 | * 8 | SR 1449 @ CLARK CREEK |
| 7 | 21.9 | * 189 | SR 1431 @ CODDLE CREEK |
| 8 | 22.0 | * 169 | SR 1166 @ BLACK CREEK |
| 9 | 22.5 | * 71 | SR 2416 @ DUTCH BUFFALO CK |
| 10 | 23.2 | * 178 | SR 1158 @ ROCKY RIVER |
| 11 | 24.3 | 30 | SR 1778 @ IRISH BUFFALO CK |
| 12 | 25.4 | * 38 | SR 1643 @ IRISH BUFFALO CK |
| 13 | 27.5 | * 143 | SR 1121 @ MUDDY CREEK |
| 14 | 27.8 | 145 | SR 1121 @ CLEAR CREEK |
| 15 | 29.7 | 165 | SR 1138 @ BLACK CREEK |
| 16 | 30.1 | 146 | SR 1132 @ CLEAR CREEK |
| 17 | 30.6 | 85 | SR 2427 @ DUTCH BUFFALO CK |
| 18 | 30.8 | 103 | NC 49 @ DUTCH BUFFALO CK |
| 19 | 31.6 | 259 | SR 2448 @ LITTLE BEAR CRK |
| 20 | 32.1 | 163 | SR 1138 @ REEDY CREEK |
| 21 | 32.1 | 176 | SR 1136 @ REEDY CREEK |
| 22 | 32.8 | 78 | SR 2442 @ BR LIT BUFFALO C |
| 23 | 33.1 | 137 | SR 1132 @ DUTCH BUFFALO CK |
| 24 | 36.9 | * 149 | SR 1132 @ IRISH BUFFALO CK |
| 25 | 36.9 | 150 | SR 1153 @ IRISH BUFFALO CK |
| 26 | 37.6 | 128 | SR 2635 @ LIT COLDWATER CK |
| 27 | 37.8 | 65 | SR 2402 @ DUTCH BUFFALO CK |
| 28 | 38.8 | 264 | SR 1745 @ BR OF IRISH BUFF |
| 29 | 39.0 | 191 | SR 1304 @ WOLF MEADOW CRK |
| 30 | 39.5 | * 72 | SR 2416 @ BLACK RUN CREEK |
| 31 | 39.9 | 135 | SR 2637 @ MCALLISTER CREEK |
| 32 | 40.0 | 113 | SR 2610 @ DUTCH BUFFALO CK |
| 33 | 41.7 | 121 | NC 73 @ ADAMS CREEK |
| 34 | 43.9 | 177 | SR 1158 @ FUDA CREEK |
| 35 | 44.0 | 201 | SR 2443 @ LITTLE BUFFALO C |
| 36 | 44.9 | 69 | US 29/601 SOUTHERN R/R |
| 37 | 45.3 | 174 | SR 1141 @ CALDWELL CREEK |
| 38 | 47.8 | 207 | SR 1143 @ BCH OF ANDERSON |
| 39 | 48.8 | 77 | SR 2416 @ LITTLE BUFFALO C |
| 40 | 48.9 | 266 | SR 1002 @ SOUTHERN R/R |

* Included in the 1994-2000 Transportation Improvement Program.

**TABLE 8**

**Functionally Obsolete Bridges in Cabarrus County**

| Map Index | Sufficiency Rating | Bridge No. | Location |
|---|---|---|---|
| 1 | 43.1 | 110 | SR 2611 @ LITTLE BEAR CREEK |
| 2 | 46.2 | 101 | SR 2453 @ LITTLE BEAR CREEK |
| 3 | 46.3 | 12 | SR 1442 @ EMERSON BRANCH |
| 4 | 46.3 | 94 | SR 2435 @ BLACK RUN CREEK |
| 5 | 46.3 | 203 | SR 2434 @ BRANCH JENNIE WOLF |
| 6 | 46.4 | 96 | NC 49 @ LITTLE COLD WATER |
| 7 | 46.7 | 118 | NC 49 @ DUTCH BUFFALO CREEK |
| 8 | 47.1 | 236 | SR 1148 @ BRANCH ROCKY RIVER |
| 9 | 47.5 | 142 | SR 1113 @ MUDDY CREEK |

* Included in the 1994-2000 Transportation Improvement Program

E. Secondary Roads

In 1989, the General Assembly of North Carolina met in session and established the Highway Trust Fund. A distinct bill within the Fund dealt primarily with secondary roads. Six and one-half percent (6.5%) of the Trust Fund shall be used to supplement the secondary roads appropriation. Ten thousand miles of unpaved secondary roads carrying 50 or more vehicles per day will be paved by 1999, and all other unpaved secondary roads by 2006.

Roadway Maintenance has prioritized all unpaved roads for Cabarrus County. The priorities are established based upon characteristics such as traffic, number of homes, number of churches, schools, and other characteristics. Each characteristic is given points, and the road with the highest total point value is ranked first and the others follow in order.

F. Transportation Improvement Program

The North Carolina Transportation Improvement Program (TIP) was organized to inform North Carolina citizens of any developments in the State Highway System. Approved by the Board of Transportation, the Department encourages any local input into the planning process for the TIP.

The highway portion of the TIP includes some of the projects needed to complete the remaining 1,704 miles of four-lane highways on the 3,600 mile Intrastate System. Once completed, 96 percent of the State's citizens will be within 10 miles of a modern four-lane highway. The program also contains multi-lane connector routes and loop roads around seven of the State's major urban areas. In addition, projects that address the most critical local and regional transportation needs are included in the program - to the extent available funding would allow.

The following is a list of projects that are scheduled in the 1994-2000 Transportation Improvement Program (TIP) for Cabarrus County.

# HIGHWAY PROGRAM

# CABARRUS COUNTY

| ROUTE/CITY | ID NO. | LOCATION AND DESCRIPTION | LENGTH (MI) (KM) | TOTAL EST. COST (THOU) | PRIOR YEARS COST (THOU) | WORK TYPE (FUNDING) EST. COST (THOU) | SCHEDULE FEDERAL FISCAL YEAR 94 95 96 97 98 99 00 |
|---|---|---|---|---|---|---|---|
| I-85 | I-1019 | GASTON COUNTY LINE TO ROWAN COUNTY LINE. LOGO SIGNING. | 34.0<br>54.7 | 215 | 15 | C(IM ) 200 | |
| NC 24-27 | R-615 * | NC 51 TO US 601. WIDEN ROADWAY TO FOUR LANES | 7.0<br>11.3 | 19312 | 4987 | D<br>R(T ) 1925<br>C(T ) 12400 | |
| NC 24-27 | R-2104 * | US 601 TO WEST CITY LIMITS OF LOCUST. WIDEN ROADWAY TO A FOUR LANE FACILITY. | 2.8<br>4.5 | 6478 | 3978 | C(T ) 2500<br>UNDER CONSTRUCTION | |
| NC 49 | R-2215 | UNCC TO EAST OF SR 1300 IN HARRISBURG. WIDEN ROADWAY TO A FOUR LANE DIVIDED FACILITY WITH FIVE LANES IN HARRISBURG. | 4.2<br>6.8 | 10950 | 5850 | D<br>R(NHS)<br>C(NHS) 5100 | |
| NC 49 | R-2533 | HARRISBURG TO YADKIN RIVER. WIDEN ROADWAY TO A MULTI-LANE FACILITY. | 29.3<br>47.2 | 55100 | 600 | P<br>D<br>R(NHS) 6000<br>C(NHS) 40200<br>POST YEAR CONSTRUCTION-8300 | |
| US 52 | R-2903 | MULTI-LANES SOUTH OF NC 49 AT RICHFIELD TO I-85 NORTH OF SALISBURY. CONSTRUCT A FOUR LANE DIVIDED FACILITY ON NEW LOCATION WITH PARTIAL CONTROL OF ACCESS. | 19.2<br>30.9 | 52800 | 600 | PROGRAMMED FOR EIS | |
| NC 73 | R-2410 | CONCORD TO ALBEMARLE. UPGRADE EXISTING TWO LANE ROADWAY. | 19.2<br>30.9 | 37500 | 100 | P<br>D<br>R(STP) 1600<br>POST YEAR ROW AND CONSTRUCTION-35800 | |

* INDICATES INTRASTATE PROJECT

ALL SCHEDULES SUBJECT TO AVAILABILITY OF FUNDS

EXCERPT FROM THE 1994-2000 NORTH CAROLINA TRANSPORTATION IMPROVEMENT PROGRAM

# HIGHWAY PROGRAM

## CABARRUS COUNTY

| ROUTE/CITY | ID NO. | LOCATION AND DESCRIPTION | LENGTH | TOTAL | PRIOR | WORK TYPE | | 94 | 95 | 96 | 97 | 98 | 99 | 00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NEW ROUTE | R-2246 | CONCORD-KANNAPOLIS, WESTSIDE BYPASS EXTENSION NC 49 TO I-85. TWO LANES ON FOUR LANE RIGHT OF WAY. | 6.5<br>10.5 | 13210 | 500 | P<br>D<br>R(STP)<br>C(STP) | <br><br>3260<br>9450 | | | | | | | |
| NEW ROUTE | R-2315 | CONNECTOR, SR 1445 (DERITA ROAD) TO US 29. TWO AND FOUR LANE FACILITY ON NEW LOCATION WITH AN INTERCHANGE AT I-85. | 3.4<br>5.5 | 10648 | 48 | D<br>C(S )<br>C(O ) | <br>5300<br>5300 | | | | | | | |
| | | | | | | RIGHT OF WAY BY DEVELOPER | | | | | | | | |
| CONCORD | U-530 | NC 136, US 601 TO NC 73. TWO LANE FACILITY WITH FOUR LANE RIGHT OF WAY ON NEW LOCATION. | 2.0<br>3.2 | 6635 | 2435 | D<br>R(S )<br>C(S ) | <br><br>4200 | | | | | | | |
| CONCORD | U-3115 | US 29, SR 2771 (I-85 CONN.), IN MECKLENBURG COUNTY TO ROCKY RIVER IN CABARRUS COUNTY. WIDEN TO PROVIDE ADDITIONAL THROUGH LANES. SR 1300 (MOREHEAD ROAD), MALLARD CREEK TO US 29 IN CABARRUS COUNTY. WIDEN ROADWAY TO MULTI-LANES. | 5.0<br>8.1 | 12000 | | P<br>D<br>R(S )<br>R(O )<br>C(S )<br>C(O ) | <br><br>1800<br>1000<br>8200<br>1000 | | | | | | | |
| | | | | | | PARTIAL RIGHT OF WAY AND CONSTRUCTION BY DEVELOPER | | | | | | | | |
| KANNAPOLIS | U-2009 | WESTSIDE BYPASS, I-85 TO ENOCHVILLE AVENUE. CONSTRUCT A MULTI-LANE FACILITY ON NEW LOCATION. | 5.8<br>9.3 | 18100 | 700 | D<br>R(S )<br>C(S ) | <br>4200<br>13200 | | | | | | | |
| KANNAPOLIS | U-2833 | SR 2126 (EARNHARDT ROAD), I-85/EARNHARDT ROAD INTERCHANGE TO SR 2014 (CENTERGROVE ROAD). REALIGN ROADWAY AND WIDEN TO MULTI-LANES, PART ON NEW LOCATION. | 1.4<br>2.3 | 6100 | | IDENTIFIED FUTURE NEED | | | | | | | | |
| US 601 | B-1076 | NC 49. REPLACE BRIDGE NO. 92 ADDITIONAL LANES ON US 601 | - | 2486 | 2486 | C(FA ) | | UNDER CONSTRUCTION | | | | | | |
| SR 1121 | B-3123 | MUDDY CREEK. REPLACE BRIDGE NO. 143 | - | 248 | | R(NFA) | 23 | RIGHT OF WAY - FFY 99 | | | | | | |

EXCERPT FROM THE 1994-2000 NORTH CAROLINA TRANSPORTATION IMPROVEMENT PROGRAM

# HIGHWAY PROGRAM — CABARRUS COUNTY

| ROUTE/CITY | ID NO. | LOCATION AND DESCRIPTION | LENGTH | TOTAL | PRIOR | WORK TYPE | 94 | 95 | 96 | 97 | 98 | 99 | 00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SR 1132 | B-2808 | ROCKY RIVER. REPLACE BRIDGE NO. 148 | - | 800 | | R(NFA) | 40 | RIGHT OF WAY - FFY 96 | | | | | |
| | | | | | | C(NFA) | 760 | CONSTRUCTION - FFY 97 | | | | | |
| SR 1132 | B-2934 | IRISH BUFFALO CREEK. REPLACE BRIDGE NO. 149 | - | 380 | | R(NFA) | 30 | RIGHT OF WAY - FFY 97 | | | | | |
| | | | | | | C(NFA) | 350 | CONSTRUCTION - FFY 98 | | | | | |
| SR 1158 | B-2935 | ROCKY RIVER. REPLACE BRIDGE NO. 178 | - | 685 | | R(NFA) | 60 | RIGHT OF WAY - FFY 97 | | | | | |
| | | | | | | C(NFA) | 625 | CONSTRUCTION - FFY 98 | | | | | |
| SR 1166 | B-2008 | BLACK CREEK. REPLACE BRIDGE NO. 169 | - | 402 | 102 | C(NFA) | 300 | CONSTRUCTION - FFY 94 | | | | | |
| SR 1304 | B-2519 | ROCKY RIVER. REPLACE BRIDGE NO. 187 | - | 476 | 75 | R(NFA) | 26 | RIGHT OF WAY - FFY 95 | | | | | |
| | | | | | | C(NFA) | 375 | CONSTRUCTION - FFY 96 | | | | | |
| SR 1431 | B-2520 | CODDLE CREEK. REPLACE BRIDGE NO. 189 | - | 486 | 85 | R(NFA) | 26 | RIGHT OF WAY - FFY 95 | | | | | |
| | | | | | | C(NFA) | 375 | CONSTRUCTION - FFY 96 | | | | | |
| SR 1449 | B-1083 | CLARK CREEK. REPLACE BRIDGE NO. 8 | - | 385 | 85 | C(NFA) | 300 | CONSTRUCTION - FFY 98 | | | | | |
| SR 1612 | B-2521 | CODDLE CREEK. REPLACE BRIDGE NO. 17 | - | 352 | | R(NFA) | 27 | RIGHT OF WAY - FFY 97 | | | | | |
| | | | | | | C(NFA) | 325 | CONSTRUCTION - FFY 98 | | | | | |
| SR 1643 | B-1082 | IRISH BUFFALO CREEK. REPLACE BRIDGE NO. 38 | - | 351 | 76 | C(NFA) | 275 | CONSTRUCTION - FFY 94 | | | | | |
| SR 2416 | B-2522 | DUTCH BUFFALO CREEK. REPLACE BRIDGE NO. 71 | - | 410 | 75 | R(NFA) | 35 | RIGHT OF WAY - FFY 96 | | | | | |
| | | | | | | C(NFA) | 300 | CONSTRUCTION - FFY 97 | | | | | |
| SR 2416 | B-2523 | BLACK RUN CREEK. REPLACE BRIDGE NO. 72 | - | 362 | 75 | R(NFA) | 37 | RIGHT OF WAY - FFY 96 | | | | | |
| | | | | | | C(NFA) | 250 | CONSTRUCTION - FFY 97 | | | | | |
| I-85 | K-2900 | REST AREA NORTH OF CONCORD. CONNECT SEWER LINE TO COUNTY SYSTEM. | - | 50 | | C(IM ) | 50 | CONSTRUCTION - FFY 95 | | | | | |
| CONCORD | W-2804 | US 601 BYPASS. WIDEN APPROACHES OF SR 1002 FOR LEFT TURN LANES AND REVISE SIGNAL. | - | 390 | 390 | C(HES) | | UNDER CONSTRUCTION | | | | | |

* INDICATES INTRASTATE PROJECT

ALL SCHEDULES SUBJECT TO AVAILABILITY OF FUNDS

EXCERPT FROM THE 1994-2000 NORTH CAROLINA TRANSPORTATION IMPROVEMENT PROGRAM

EXCERPT FROM THE 1994-2000 NORTH CAROLINA
TRANSPORTATION IMPROVEMENT PROGRAM

## HIGHWAY PROGRAM — CABARRUS COUNTY

| ROUTE/CITY | ID NO. | LOCATION AND DESCRIPTION | LENGTH | TOTAL | PRIOR | WORK TYPE | 94 | 95 | 96 | 97 | 98 | 99 | 00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HARRISBURG | Y-2966A | SR 1182 (MILLBROOK ROAD) AT SOUTHERN RAILWAY CROSSING 715 334K. INSTALL AUTOMATIC WARNING DEVICES. RAIL PASSENGER CROSSING. | - | 78 | 78 | C(RR ) | FUNDED - CONSTRUCTION NOT AUTHORIZED | | | | | | |
| CONCORD | Z-2966C | KERR STREET AT SOUTHERN RAILWAY CROSSING 715 315F. INSTALL AUTOMATIC WARNING DEVICES. | - | 75 | | C(RR ) | 75 | CONSTRUCTION - FFY 97 | | | | | |
| CONCORD | Z-3166A | SR 1304 AT SOUTHERN RAILROAD CROSSING 736 256N. REVISE AUTOMATIC WARNING DEVICES. | - | 75 | | C(RR ) | 75 | CONSTRUCTION - FFY 97 | | | | | |
| MIDLAND | Z-2966B | SR 1110 (BROADWAY STREET) AT SOUTHERN RAILROAD CROSSING 728 813C. INSTALL AUTOMATIC WARNING DEVICES. | - | 75 | | C(RR ) | 75 | CONSTRUCTION - FFY 96 | | | | | |

# VII. RECOMMENDATIONS

## A. Municipal Thoroughfare Plans

Thoroughfare plans have been developed for municipal areas in Cabarrus County to assist in the development of a logical and efficient street system. The municipalities with such plans are Harrisburg and the KANLACON Urban Area (including Concord, Kannapolis, Landis, and China Grove).

1. Harrisburg - A thoroughfare plan for Harrisburg dated August 23, 1990 was adopted by the Town of Harrisburg and the North Carolina Department of Transportation.

   Major improvements included in the plan are the following:

   - Alexander Avenue extension to Robinson Church Road (SR 1166)
   - Stallings Road (SR 1161) extension to Alexander Avenue extension
   - Caldwell Road (SR 1173) extension from NC 49 to Morehead Road (SR 1300) north of Rocky River
   - Northern Corridor from Caldwell Road extension @ Morehead Road to Stallings Road
   - Tom Query Road (SR 1166) extension to Stallings Road @ Northern Corridor

The Caldwell Road, Northern Corridor, and Tom Query Road extensions combine to form a loop around the town.

2. KANLACON - The KANLACON Technical Report of 1988 includes an adopted thoroughfare plan dated February 8, 1988.

   Major improvements included in this plan are the following:

   - Westside Bypass from NC 49 at Barnhardt Road (SR 1309) to NC 136
   - NC 136 from US 601 Business to NC 73
   - Crestmont Road (SR 2643) extension to Penninger Road (SR 2113)
   - Earnhardt Road (SR 2126) extension to Penninger Road

   The plan is currently being updated and is expected to be completed in late 1994.

3. NC 49: Corridor Study - An independent study was performed on NC 49 in efforts of providing relief to the corridor's present and anticipated capacity problems. The section of NC 49 analyzed begins at UNC-Charlotte and travels through Cabarrus County to NC 8 in Stanly County. The corridor study was prepared by the Department of Transportation, Statewide Planning Branch, in January 1992. The study has produced one recommended alternative route which will bypass Harrisburg as seen in **Figure 9.** The following is a description of the proposed construction alignment for the project as seen in the report. Please refer to the corridor study for further information.

**PROPOSED NC 49 BYPASS:** Construct an NC 49 Bypass from US 29 to East of Concord. This bypass would consist of a four lane divided cross section with a minimum 46-foot median on 250 feet of right of way (See cross section B, Appendix C) with full control of access. It is recommended that this bypass be built to the south of Harrisburg. The recommended time frame for this project is to begin construction by the year 2000. If constructed, this bypass would eliminate the need for stage III of Presnell Associates' project plan, eight lanes along NC 49 from Mecklenburg County to approximately 1000 feet east of Morehead Road (SR 1300) in Harrisburg **(See TIP project R-2215).**

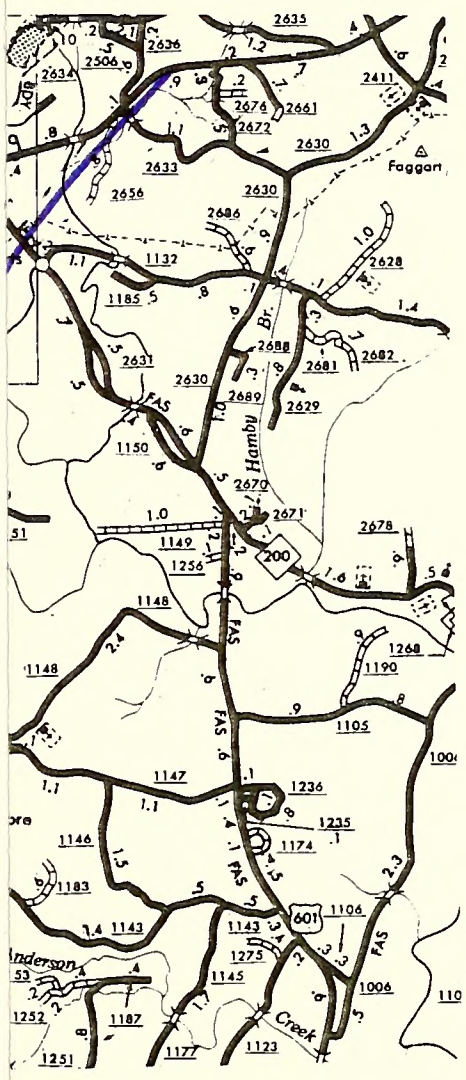
**** It should be noted that Cabarrus County Planning and Zoning Commission is against any realignment of this road from the present corridor.**

4. The Carolinas Parkway Phase I Feasibility Study: The Carolinas Parkway is a proposed outer-ring freeway for the Charlotte region of North and South Carolina. It would circle Charlotte at a distance of approximately 30 to 50 miles and connect major towns and cities in the area. The road would be designed to link I-77, I-85, and other major radial highways in the Charlotte region. The concept for this highway evolved over several years and was formally proposed in Jan., 1992, by the Carolinas Transportation Compact in their report Moving Together -- A Regional Transportation Vision for the Next Century. The Phase I Feasibility Study was completed in Sept., 1992.

   There were two corridors studied for the Carolinas Parkway. The first corridor roughly follows the NC 150 corridor across the southern part of Iredell County. The second corridor, which would have a direct effect on Cabarrus County runs north and south just west of the KANLACON Urban Area. However, since the corridor is almost five miles wide, no specific alignment can be discussed here. Population and employment projections under various scenarios were used to determine future travel estimates on the proposed Parkway. Average daily traffic estimates for the section of the proposed Parkway in Cabarrus County in the year 2030 ranged from approximately 23,000 to 37,000 vehicles per day.

   The Phase I Feasibility Study was designed to test whether the benefits derived by the traveling public would out-weigh the costs involved in the Parkway's construction. The findings concluded that the $2.0 billion cost would be offset by more than $14 billion in benefits over a 20-year period of operation. The study program originally called for the completion of Phase II and Phase III studies, focusing on the location of the actual alignment of the roadway, the identification of other needed highway improvements in the area, and the development of construction recommendations. However, with the recent change of administration in North Carolina, funding for the continued study of this project has been, at least temporarily, discontinued.

For more information regarding this project, please refer to the Carolinas Parkway Phase I Feasibility Study, NCDOT, Sept., 1992.




# HARRISBURG BYPASS PREFERRED ALTERNATIVE

## FIGURE 9

## MECKLENBURG & CABARRUS COUNTIES NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

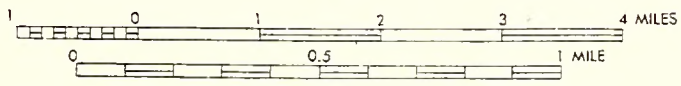
DIVISION OF HIGHWAYS — PLANNING AND RESEARCH BRANCH

IN COOPERATION WITH THE

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

SCALE




SCALE FOR ENLARGEMENTS

**PROPOSED NC 49 BYPASS:** Construct an NC 49 Bypass from US 29 to East of Concord. This bypass would consist of a four lane divided cross section with a minimum 46-foot median on 250 feet of right of way (See cross section B, Appendix C) with full control of access. It is recommended that this bypass be built to the south of Harrisburg. The recommended time frame for this project is to begin construction by the year 2000. If constructed, this bypass would eliminate the need for stage III of Presnell Associates' project plan, eight lanes along NC 49 from Mecklenburg County to approximately 1000 feet east of Morehead Road (SR 1300) in Harrisburg **(See TIP project R-2215).**

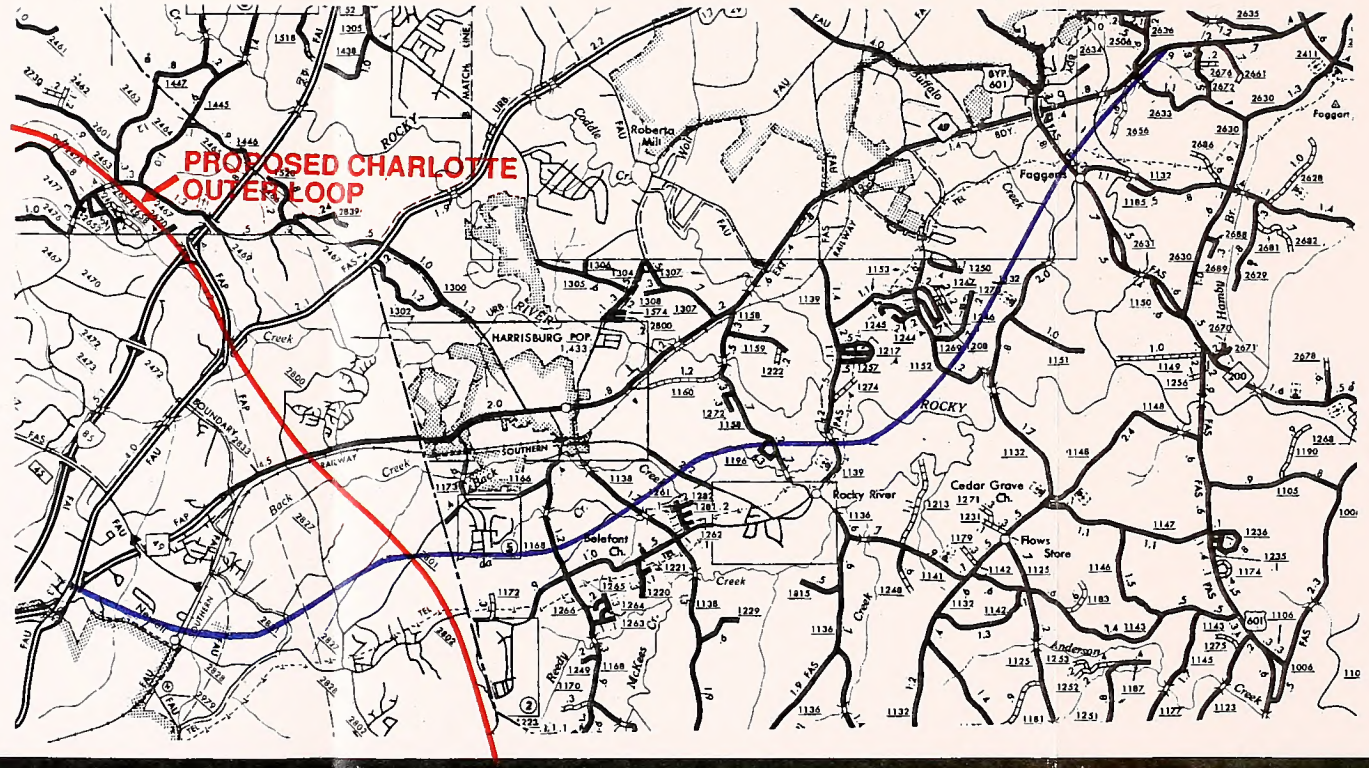
**** It should be noted that Cabarrus County Planning and Zoning Commission is against any realignment of this road from the present corridor.**

4. The Carolinas Parkway Phase I Feasibility Study: The Carolinas Parkway is a proposed outer-ring freeway for the Charlotte region of North and South Carolina. It would circle Charlotte at a distance of approximately 30 to 50 miles and connect major towns and cities in the area. The road would be designed to link I-77, I-85, and other major radial highways in the Charlotte region. The concept for this highway evolved over several years and was formally proposed in Jan., 1992, by the Carolinas Transportation Compact in their report Moving Together -- A Regional Transportation Vision for the Next Century. The Phase I Feasibility Study was completed in Sept., 1992.

   There were two corridors studied for the Carolinas Parkway. The first corridor roughly follows the NC 150 corridor across the southern part of Iredell County. The second corridor, which would have a direct effect on Cabarrus County runs north and south just west of the KANLACON Urban Area. However, since the corridor is almost five miles wide, no specific alignment can be discussed here. Population and employment projections under various scenarios were used to determine future travel estimates on the proposed Parkway. Average daily traffic estimates for the section of the proposed Parkway in Cabarrus County in the year 2030 ranged from approximately 23,000 to 37,000 vehicles per day.

   The Phase I Feasibility Study was designed to test whether the benefits derived by the traveling public would out-weigh the costs involved in the Parkway's construction. The findings concluded that the $2.0 billion cost would be offset by more than $14 billion in benefits over a 20-year period of operation. The study program originally called for the completion of Phase II and Phase III studies, focusing on the location of the actual alignment of the roadway, the identification of other needed highway improvements in the area, and the development of construction recommendations. However, with the recent change of administration in North Carolina, funding for the continued study of this project has been, at least temporarily, discontinued.

For more information regarding this project, please refer to the Carolinas Parkway Phase I Feasibility Study, NCDOT, Sept., 1992.




# HARRISBURG BYPASS PREFERRED ALTERNATIVE

## FIGURE 9

## MECKLENBURG & CABARRUS COUNTIES

## NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS—PLANNING AND RESEARCH BRANCH

IN COOPERATION WITH THE

U. S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

SCALE

1 0 1 2 3 4 MILES

0 0.5 1 MILE

SCALE FOR ENLARGEMENTS

B. 1994 Thoroughfare Plan

1. Explanation of Changes to 1985 Plan - Several of the priority recommendations on the 1985 Cabarrus County Thoroughfare Plan have been upgraded or removed in 1992. Three of these; Westside Bypass, NC 49 widening, and NC 24/27 widening have been placed in the 1994-2000 Transportation Improvement Program for North Carolina. Each is scheduled to begin construction or right of way acquisition by 1998. Others removed are SR 1168 (Robinson Road) because it has been incorporated into the 1991 Harrisburg Thoroughfare Plan and the NC 49 Bypass which is being replaced by a more extensive bypass proposal (See 1991 NC 49 Corridor Study from the Yadkin River to US 29).

**** Again, it should be noted that Cabarrus County Planning and Zoning Commission is against any realignment of this road from the present corridor.**

2. Recommended Improvements - In order to provide a comprehensive thoroughfare plan for Cabarrus County, a broad range of recommendations must be made. In the place of the 1985 recommendations that have been placed in the TIP, several new recommendations may be made. Improvements may vary from construction of a new principal arterial to widening pavement on a minor collector or unclassified local road.

The recommended thoroughfare plan for Cabarrus County is shown in **Figure 10.** A proposed construction plan for Cabarrus County is shown in **Figure 11.**

**Principal Arterials:**

The following principal arterials serve primarily interstate and statewide travel.

NC 49 - From KANLACON Metropolitan Area Boundary (MAB) to Stanly County. NC 49 is programed for improvement on the current Transportation Improvement Program (TIP) to widen the roadway to a multi-lane facility. **(See TIP #: R-2533 & R-2215 and the NC 49 Corridor Study for further improvements)**

NC 73 - From Mecklenburg County to KANLACON MAB. This facility is projected to carry approximately 10,600 vehicles per day for the design year of 2020. It does not meet the minimum tolerable lane width requirement and should be widened to a 4-lane divided facility from Mecklenburg County to the KANLACON MAB. In addition, widening of NC 73 to 4-lanes should be considered if the development of the Kings Grant area continues.

US 52 - From Rowan County to Stanly County. This 1-mile section of US 52 is currently being upgraded to a multi-lane facility. There are no additional improvements recommended. **(See TIP #: R-2903)**

**Minor Arterials:**

Minor arterials aid principal arterials by helping form a network which links larger towns and cities in the county. The minor arterials for Cabarrus County are:

US 601 - From Union County to KANLACON MAB. This facility will exceed its present capacity within the design year and should be widened to a 4-lane divided facility from the from Union County to KANLACON MAB.

NC 24/27 - From Mecklenburg County to Stanly County. This facility is currently being widened to 4-lanes. There are no additional improvements recommended. **(See TIP #: R-615 & R-2104)**

**Collector Road System**

The major collector roads will assist the arterial system by providing an interconnecting network between smaller populated centers and feed this traffic to the arterial systems. The minor collector roads will provide the link between local roads and higher system roads.

**Major Collectors:**

NC 73 - From KANLACON MAB to Stanly County. This facility will exceed its present capacity within the design year and should be widened to a 4-lane divided facility from the KANLACON MAB to Stanly County. The current Transportation Improvement Program (TIP) project R-2410 calls for the upgrade of this facility to 2-lane standards. The feasibility study for this project included a 4-mile bypass of Mount Pleasant to facilitate the flow of a large portion of existing traffic. The bypass, coupled with an interchange at NC 49, would enable through traffic to avoid travel flow restrictions such as low speeds, signals, and conflicting turning movements within the City limits of Mount Pleasant. The bypass would also limit the environmental and construction impacts to the Mount Pleasant Historic District and the First Congregational Church. **(See TIP Projects R-2533 and R-2410)**

NC 136 - From SR 1442 to Iredell County. No improvements necessary.

NC 200 - From Stanly County to US 601. Shoulder improvements are recommended to improve roadside recovery distance and allow for proper sight distance. No other improvements necessary.

SR 1006 (Mount Pleasant Road) - From Rowan County to US 601. This facility does not meet the minimum tolerable lane width requirement and should be upgraded to 2-lane, 24′ wide standards.

SR 1106 - From SR 1006 to US 601. This facility does not meet the minimum tolerable lane width requirement and should be widened from 18′ to 24′ wide standards.

SR 1139 (Rocky River Road) - From Mecklenburg County to KANLACON MAB. This facility does not meet the minimum tolerable lane width requirement and should be widened from 16′ to 24′ wide standards.

SR 1168 (Robinson Church Road) - From Mecklenburg County to the KANLACON MAB. This facility does not meet the minimum tolerable lane width requirement and should be widened to 2-lane, 24′ wide standards.

SR 1394 (Poplar Tent Road) - From Mecklenburg County to the KANLACON MAB. A 1.2 mile section of this facility does not meet the minimum tolerable lane width requirement and should be widened from 18′ to 24′ wide standards. **(See Figure 11)**

**Minor Collectors:**

SR 1132 (Miami Church Road) - From the KANLACON MAB to NC 24/27. A 3.9 mile section of this facility does not meet the minimum tolerable lane width requirement and should be widened from 18′ to 24′ wide standards. **(See Figure 11)**

SR 1136 (Lower Rocky River) - From SR 1139 to Mecklenburg County. This facility does not meet the minimum tolerable lane width requirement and should be widened from 18′ to 24′ wide standards.

SR 1449 (Harris Road) - From Mecklenburg County to SR 1394 (Poplar Tent Road). No improvements necessary.

SR 1601 (Odell School Road) - From NC 136 to the KANLACON MAB. This facility does not meet the minimum tolerable lane width requirement and should be widened from 18′ to 24′ wide standards.

SR 2400 (Barrier Road) - From the KANLACON MAB to SR 2411. No improvements necessary.

SR 2408 (Gold Hill Road) - From the KANLACON MAB to SR 1006 (Mt. Pleasant Road North). A 4.0 mile section of this facility does not meet the minimum tolerable lane width requirement and should be widened from 18′ to 24′ wide standards.

SR 2411 (Irish Potato Road) - From SR 2400 to SR 1006. A 5.38 mile section of this facility does not meet the minimum tolerable lane width requirement and should be widened from 16′/18′ to 24′ wide standards.

SR 2444 (St. Stephens Church Road) - From Rowan County to NC 49. No improvements necessary.

SR 2622 (Barriers Store Road) - From SR 1006 to Stanly County. No improvements necessary.

SR 2635 (Old Airport Road) - From KANLACON MAB to NC 49. No improvements necessary.

## C. Other Projects

Additional projects have been recommended to decrease accidents at intersections and to increase traffic safety. These suggestions are based on total number of accidents, county planning input, and field investigations.

- A traffic signal study is needed at the following three intersections to improve the flow of the currently conflicting traffic pattern. They are the intersections of US 601/NC 24-27, SR 1168 (Robinson Church Road)/SR 1139 (Rocky River Road), and SR 1138 (Morrison Road)/SR 1139.

- A potentially hazardous sharp curve located .3 miles west of SR 1220 (McMillian Drive) on SR 1139 should be investigated. It is recommended that signing be enhanced to increase driver awareness, possibly warning flashers or additional sharp curve signs. A roadway alignment investigation should be conducted by the Traffic Engineering Branch (NCDOT) for possibly correcting this potentially dangerous roadway section.

## D. Improvement Priorities

The improvements to the Cabarrus County Thoroughfare Plan should not all be completed at once. The cost of such immediate action would be overwhelming. In addition, there is no immediate need for many of the improvements as the thoroughfare plan is intended to meet present needs and anticipated needs over the planning period. In an effort to reflect the relative value of various improvements, an assessment of expected benefits has been made and compared to projected costs for each improvement. The result of this benefit-cost analysis is a listing of priorities for the recommended improvements.

Priorities have been set by comparing benefits to expected project costs. Three principal measures of benefits were used: road user cost savings, the potential for increased economic development, and the environmental impact resulting from the improvement. The first measure is an actual estimate of dollar savings, while the others are estimates of the probability of a resulting change.

Reduced road user costs should result from a roadway improvement, whether simple widening or construction of a new roadway to relieve congested or unsafe conditions. Comparisons of the existing and proposed roadway have been made in terms of vehicle operating costs, travel time costs, and accident costs. The user benefits are computed as total dollar savings over a 20 year design period. Data included project length, base and design year traffic volumes, traffic speed, type of roadway, and volume/capacity ratio.

The impact of a project on economic development potential is denoted by the probability that it will stimulate the economic development of an area. This is accomplished by providing access to developable land and reducing transportation costs. It is a subjective estimate based on the knowledge of the proposed project, local development characteristics, and land development potential. The probability is rated on a scale from 0 (none) to 1 (excellent).

The environmental impact analysis considers the effect of a project on physical, social/cultural, and economic environments. Table 9 lists the items considered when evaluating the impact to the environment. Many of those listed have been accounted for in evaluating the project with respect to user benefits, cost, and economic development potential. However, twelve environmental factors are generally not considered in these evaluations. These are environmental impacts of a project to the following: (1) air quality, (2) water resources, (3) soils and geology, (4) wildlife, (5) vegetation, (6) neighborhoods, (7) noise, (8) educational facilities, (9) churches, (10) parks and recreational facilities, (11) historic sites and landmarks, and (12) public health and safety. The summation of both positive and negative impact probabilities with respect to these 12 factors provides a measure of the relative environmental impact of a project.

Table 9 - Environmental Considerations

| Physical | Social & Cultural | Economic |
|---|---|---|
| Air quality | Housing | Businesses |
| Water Resources | Neighborhoods | Employment |
| Soils and Geology | Noise | Economic Development |
| Wildlife | Educational Facilities | Public Utilities |
| Vegetation | Churches | Transportation |
| Parks | Costs | Capital Costs |
| | Recreational Facilities | Operation and Maintenance Costs |
| | Public Health and Safety | |
| National Defense | Aesthetics | |

Offsetting the benefits derived from any project is the construction cost. A new roadway, despite high projected benefits, might prove to be unjustified due to excessive construction costs. The highway costs estimated in this report are based on average statewide construction costs for similar project types. An estimate of anticipated right-of-way costs is also included. Table 10 evaluates the proposed Cabarrus County projects with respect to user benefits, estimated costs, probability of economic development, and environmental impact.

To guide both the State and County in efforts to implement the recommended improvements of this report, the proposed projects have been placed in order of probable need. These priorities are shown in Table 10 (each improvement is listed in Appendix A with recommended cross section and right of way). Since conditions are constantly changing over time, these priorities should be periodically reevaluated by the County and the Division Engineer. Other roadway improvements, also included in Appendix A, are considered to be low priority projects.

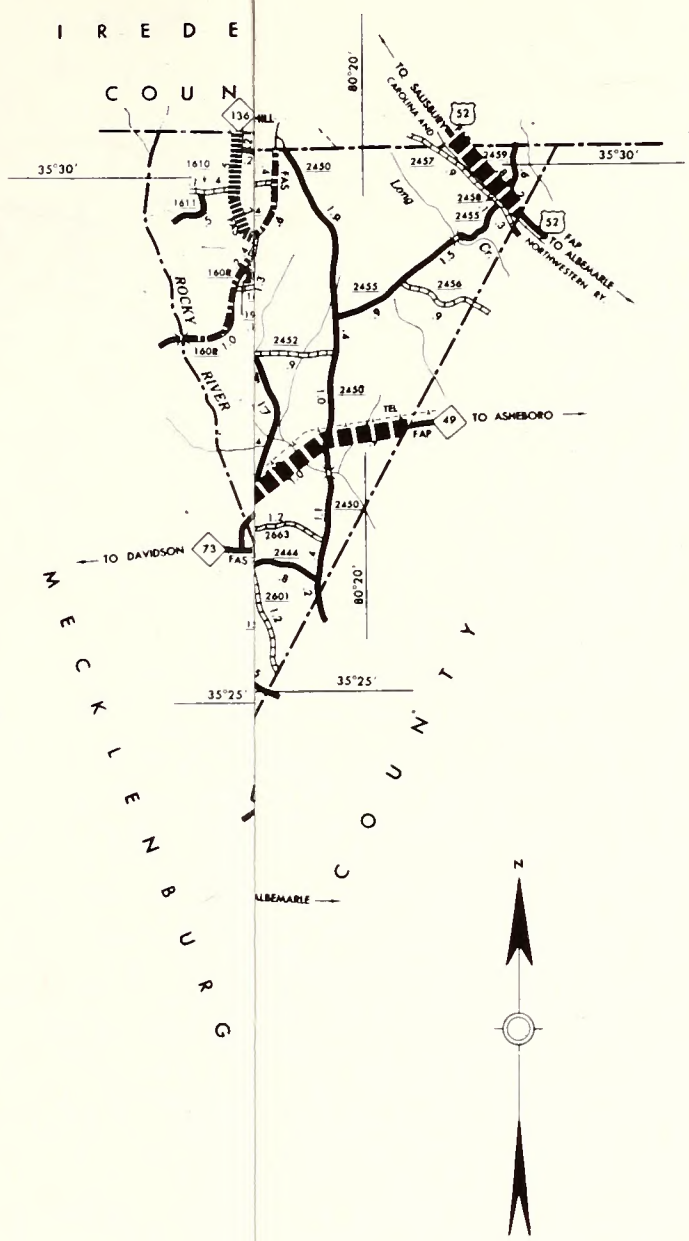
Table 10 - Benefits Evaluation of Recommendations

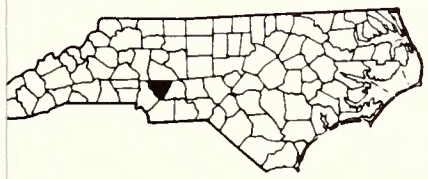
| Recommendations/Priority | Length (Miles) | Total Benefit (x 1000) | Cost (x 1000) | Economic Development Potential Probability | Environmental Impact Probability |
|---|---|---|---|---|---|
| 1)* NC 49 Bypass, proposed four lane divided facility on new location from US 29 (Mecklenburg County) to NC 49 just west of SR 2672 (Hidden Valley Road) | 17.3 | 360,000 | 79,200 | .60 | + 0.55<br>- 0.45 |
| 2) NC 73 widen to a four lane divided section from SR 2642 (Moose Lodge Road) to Stanly County, including: | 10.14 | 62,700 | 21,100 | .50 | + 0.40<br>- 0.35 |
| R-2410 bypass of Mount Pleasant (feasibility study) | 4.10 | | 11.700 | | |
| 3) NC 73 widen to a four lane divided section from Kanlacon MAB (west) to Mecklenburg County | 0.70 | 5,470 | 1,010 | .50 | + 0.40<br>- 0.35 |
| 4) US 601 widen to a four lane divided section from Kanlacon MAB (east) to Union County | 11.06 | 29,112 | 16,070 | .35 | + 0.50<br>- 0.10 |
| 5) SR 1139 (Rocky River Rd.) widen to 2-lane standards from Meck. County to Urban Bdry. | 4.54 | 11,599 | 2,040 | .14 | + 0.10<br>- 0.00 |
| 6) SR 1168 (Robinson Ch. Rd.) widen to 2-lane standards from Meck. County to Urban Bdry. | 3.10 | 8,828 | 1,160 | .14 | + 0.10<br>- 0.00 |
| 7) SR 1006 (Mt. Pleasant Rd.) widen to 2-lane standards from Rowan County to US 601, partial section. | 15.04 | 8,760 | 6,010 | .14 | + 0.10<br>- 0.00 |

* Figures for NC 49 are for the entire project, some of which is located in Mecklenburg County

Table 10 (cont'd) - Benefits Evaluation of Recommendations

| Recommendations/Priority | Length (Miles) | Total Benefit (x 1000) | Cost (x 1000) | Economic Development Potential Probability | Environmental Impact Probability |
|---|---|---|---|---|---|
| 8) SR 1136 (Lower Rocky River) widen to 2-lane standards from SR 1139 to Meck. County. | 4.80 | 2,739 | 1,920 | .14 | + 0.10<br>- 0.00 |
| 9) SR 2408 (Gold Hill Rd.) widen to 2-lane standards from MP 3.10 to SR 1006. | 4.00 | 2,258 | 1,600 | .14 | + 0.10<br>- 0.00 |
| 10) SR 1394 (Poplar Tent Rd.) widen to 2-lane standards from Meck. County to SR 1449. | 1.20 | 617 | 480 | .14 | + 0.10<br>- 0.00 |
| 11) SR 1601 (Odell School Rd.) widen to 2-lane standards from NC 136 to Urban Bdry. | 1.10 | 601 | 440 | .14 | + 0.10<br>- 0.00 |
| 12) SR 1132 (Miami Church Rd.) widen to 2-lane standards from SR 1125 to NC 24/27. | 3.90 | 1,637 | 1,560 | .14 | + 0.10<br>- 0.00 |
| 13) SR 2411 (Irish Potato Rd.) widen to 2-lane standards from NC 73 to SR 1006. | 5.38 | 2,073 | 2,010 | .14 | + 0.10<br>- 0.00 |



ROADS

ROADS.

## LEGEND

- PRIMITIVE OR UNIMPROVED ROAD
- GRADED AND DRAINED ROAD
- SOIL, GRAVEL, OR STONE SURFACED ROAD
- HARD SURFACED ROAD
- 4 LANE UNDIVIDED HIGHWAY
- DIVIDED HIGHWAY
- HIGHWAY WITH FRONTAGE ROADS
- F.C.A. — FULL CONTROL ACCESS
- FAI — FEDERAL AID INTERSTATE ROAD
- FAP — FEDERAL AID PRIMARY ROAD
- FAS — FEDERAL AID SECONDARY ROAD
- FAU — FEDERAL AID URBAN
- NS — NON-SYSTEM ROAD
- FAP — PROJECTED LOCATION
- 4 — INTERSECTION DISTANCE
- TRAFFIC CIRCLE
- HIGHWAY INTERCHANGE
- DETAILED HIGHWAY INTERCHANGE
- 40 — INTERSTATE HIGHWAY
- 70 — U.S. NUMBERED HIGHWAY
- 1 — U.S. NUMBERED BICYCLE ROUTE
- 42 — N.C. NUMBERED HIGHWAY
- N.C. NUMBERED BICYCLE ROUTE
- 207 — INTERSTATE INTERCHANGE NUMBER
- 1100 — SECONDARY ROAD NUMBER
- TEL — UNDERGROUND CABLE
- RAILROAD, ANY NUMBER OF TRACKS USED BY SINGLE OPERATING COMPANY
- RAILROAD, ANY NUMBER OF TRACKS USED BY MORE THAN ONE OPERATING COMPANY ON SAME OR ADJACENT RIGHTS-OF-WAY
- RAILROAD STATION
- GRADE CROSSING
- UNDERPASS
- OVERPASS
- RAILROAD TUNNEL
- O — ARMY, NAVY, OR MARINE CORPS FIELD
- COMM. OR MUNICIPAL AIRPORT
- MARKED AUXILIARY FIELD
- HANGAR ON FIELD ("B" IN SYMBOL)
- FREE OR TOLL FERRY
- LIGHTHOUSE
- COAST GUARD STATION
- CANAL
- NARROW STREAM
- WIDE STREAM
- DAM WITH LOCK
- DAM
- RESERVOIR, POND, OR LAKE
- 576.3 — PROMINENT PEAK, NUMERALS INDICATE ELEVATION
- ROAD THROUGH MOUNTAIN PASS
- HIGHWAY BRIDGE, OVER 20 FT.
- DRAW SPAN ON BRIDGE
- HIGHWAY TUNNEL
- FORD
- STATE LINE
- COUNTY LINE
- CITY LIMITS
- RESERVATION OR PARK BOUNDARY
- INSET AREA
- UNINCORPORATED CENSUS DESIGNATED PLACE
- COUNTY SEAT
- OTHER TOWNS AND VILLAGES
- TRIANGULATION STATION
- INCORPORATED CITY OR VILLAGE (GENERALIZED)
- SCHOOL
- CHURCH
- CHURCH WITH CEMETERY
- CEMETERY
- HOSPITAL
- CORRECTIONAL OR PENAL INSTN.
- HIGHWAY GARAGE OR MAINT. YARD
- HIGHWAY DIV. OR DIST. OFFICE
- WEIGHT STATION
- PATROL STATION
- REST AREA
- MONUMENT — SMALL HISTORICAL SITE

## LEGEND

| HIGHWAY CLASSIFICATION | EXISTING | PROPOSED |
|---|---|---|
| PRINCIPAL ARTERIALS | | |
| INTERSTATE | | |
| OTHERS | | |
| MINOR ARTERIALS | | |
| MAJOR COLLECTORS | | |
| MINOR COLLECTORS | | |
| MAJOR URBAN THOROUGHFARE | | |
| URBAN FREEWAY OR EXPRESSWAY | | |
| URBAN THOROUGHFARE PLANNING BOUNDARY | | |

**ADOPTED BY:**
CABARRUS COUNTY_____

**RECOMMENDED FOR APPROVAL BY:**
STATEWIDE PLANNING BRANCH_____

**ADOPTED BY:**
DEPT. OF TRANSPORTATION_____

**PUBLIC MEETING:**_____

**PUBLIC HEARING:**_____

**FIGURE 10**

# RECOMMENDED THOROUGHFARE PLAN

# CABARRUS COUNTY

## NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH

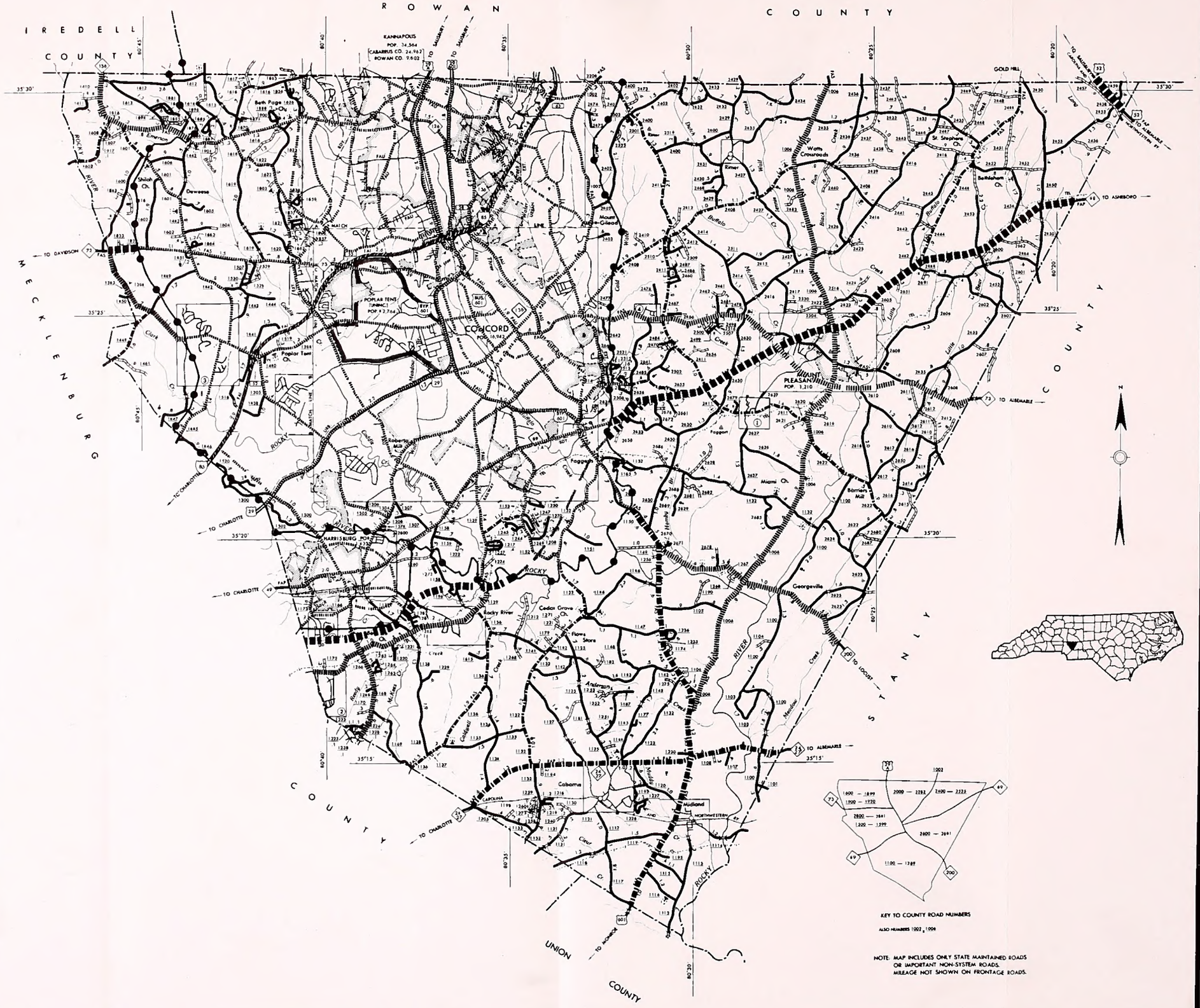
U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4

SCALE IN MILES

BASE: 1992




## LEGEND

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- FEDERAL AID PRIMARY ROAD
- FEDERAL AID SECONDARY ROAD
- FEDERAL AID URBAN
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- PROJECTED LOCATION
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- TRAFFIC CIRCLE
- HIGHWAY INTERCHANGE
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- COMM. OR MUNICIPAL AIRPORT
- MARKED AUXILIARY FIELD
- HANGAR ON FIELD ("X" IN SYMBOL)
- FREE OR TOLL FERRY
- LIGHTHOUSE
- COAST GUARD STATION
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- NARROW STREAM
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## LEGEND

| HIGHWAY CLASSIFICATION | EXISTING | PROPOSED |
|---|---|---|
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ADOPTED BY:
CABARRUS COUNTY_____

RECOMMENDED FOR APPROVAL BY:
STATEWIDE PLANNING BRANCH_____

ADOPTED BY:
DEPT. OF TRANSPORTATION_____

PUBLIC MEETING:_____

PUBLIC HEARING:_____

**FIGURE 10**

KEY TO COUNTY ROAD NUMBERS

ALSO NUMBERS 1002 & 1004

NOTE: MAP INCLUDES ONLY STATE MAINTAINED ROADS OR IMPORTANT NON-SYSTEM ROADS. MILEAGE NOT SHOWN ON FRONTAGE ROADS.

# RECOMMENDED THOROUGHFARE PLAN

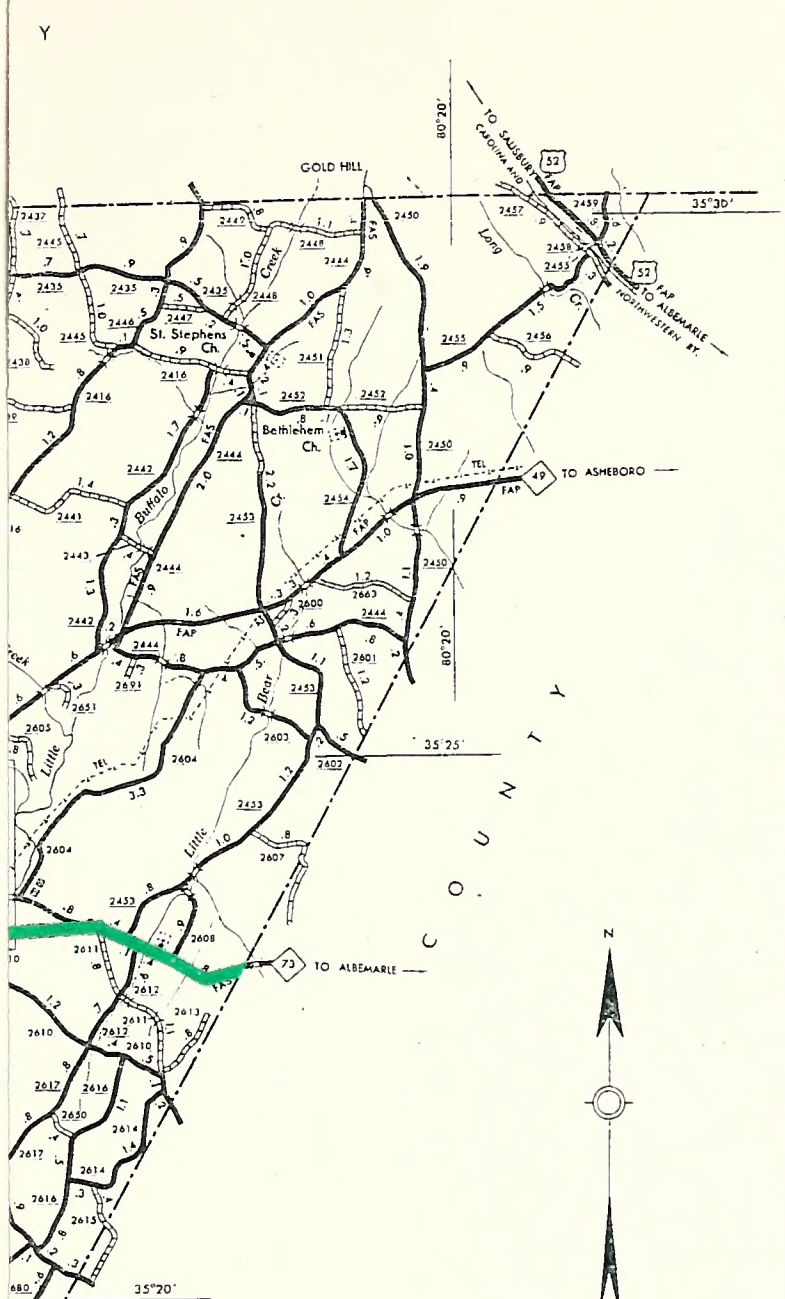
# CABARRUS COUNTY

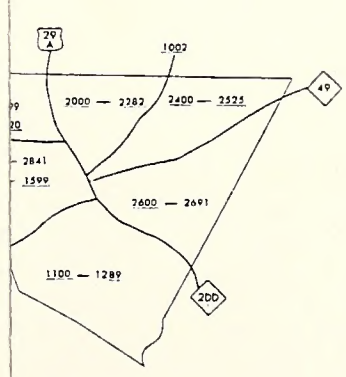
## NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH
IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4
SCALE IN MILES

BASE: 1992






KEY TO COUNTY ROAD NUMBERS

ALSO NUMBERS 1002, 1006

NOTE: MAP INCLUDES ONLY STATE MAINTAINED ROADS OR IMPORTANT NON-SYSTEM ROADS. MILEAGE NOT SHOWN ON FRONTAGE ROADS. ROADS SHOWN AS OF JAN. 1, 1990

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- RAILROAD, ANY NUMBER OF TRACKS USED BY MORE THAN ONE OPERATING COMPANY ON SAME OR ADJACENT RIGHTS-OF-WAY
- RAILROAD STATION
- GRADE CROSSING
- UNDERPASS
- OVERPASS
- RAILROAD TUNNEL
- ARMY, NAVY, OR MARINE CORPS FIELD
- COMM. OR MUNICIPAL AIRPORT
- MARKED AUXILIARY FIELD
- HANGAR ON FIELD ("B" IN SYMBOL)
- FREE OR TOLL FERRY
- LIGHTHOUSE
- COAST GUARD STATION
- CANAL
- NARROW STREAM
- WIDE STREAM
- DAM WITH LOCK
- DAM
- RESERVOIR, POND, OR LAKE
- 576.3 — PROMINENT PEAK, NUMERALS INDICATE ELEVATION
- ROAD THROUGH MOUNTAIN PASS
- HIGHWAY BRIDGE, OVER 20 FT.
- DRAW SPAN ON BRIDGE
- HIGHWAY TUNNEL
- FORD
- STATE LINE
- COUNTY LINE
- CITY LIMITS
- RESERVATION OR PARK BOUNDARY
- INSET AREA
- UNINCORPORATED CENSUS DESIGNATED PLACE
- COUNTY SEAT
- OTHER TOWNS AND VILLAGES
- TRIANGULATION STATION
- INCORPORATED CITY OR VILLAGE (GENERALIZED)
- SCHOOL
- CHURCH
- CHURCH WITH CEMETERY
- CEMETERY
- HOSPITAL
- CORRECTIONAL OR PENAL INSTN
- HIGHWAY GARAGE, OR MAINT YARD
- HIGHWAY DIV OR DIST OFFICE
- WEIGHT STATION
- PATROL STATION
- REST AREA
- MONUMENT — SMALL HISTORICAL SITE

# CONSTRUCTION PLAN

## LEGEND

- PROPOSED 4 LN DIVIDED
- PROPOSED 4 LN UNDIVIDED
- PROPOSED 2 LN WIDENING
- METROPOLITAN AREA BOUNDARY

# CABARRUS COUNTY

## NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH

U.S. DEPARTMENT OF TRANSPORTATION

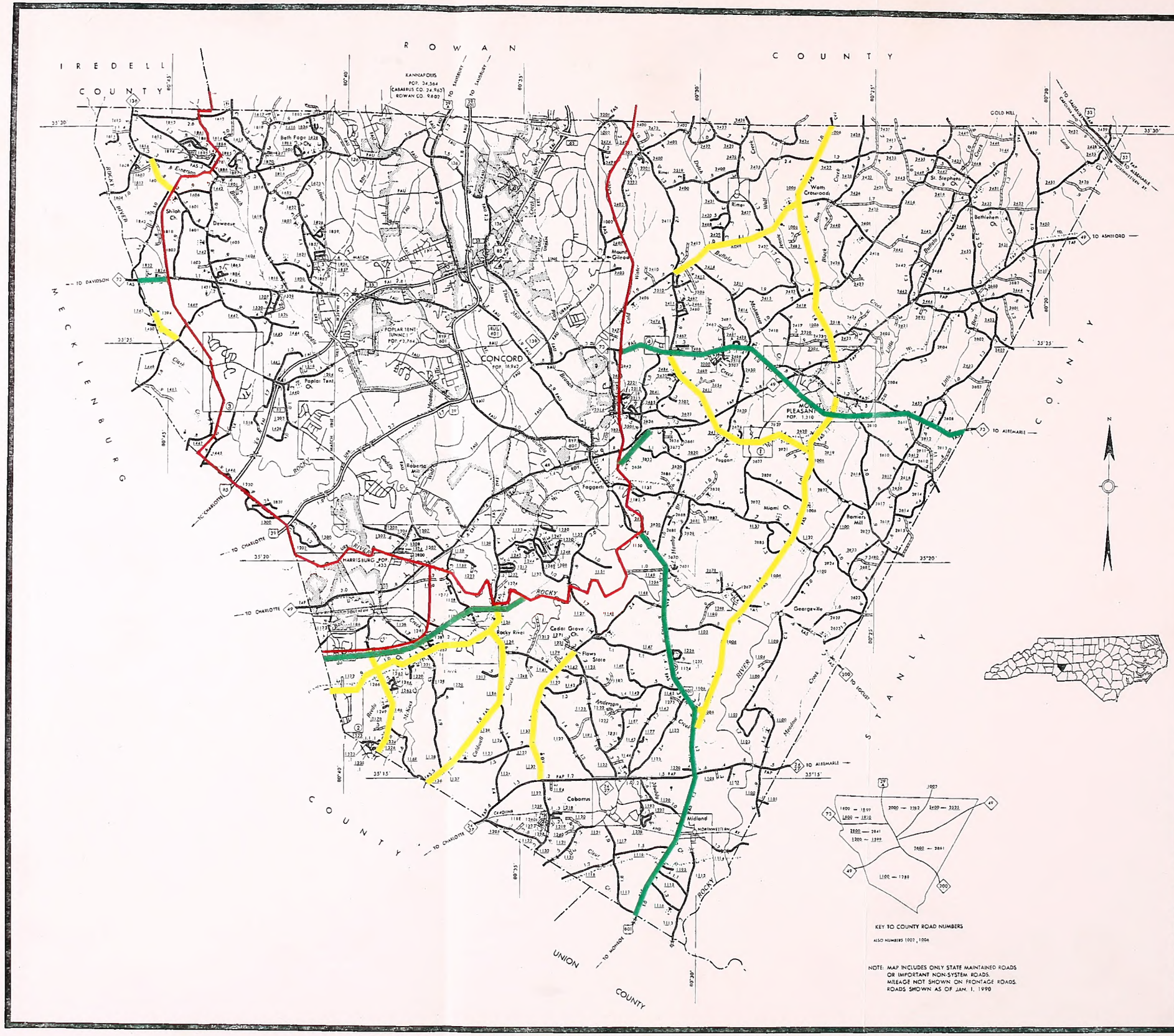
FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4

SCALE IN MILES

BASE: 1992

FIGURE 11




## LEGEND

- PRIMITIVE OR UNIMPROVED ROAD
- GRADED AND DRAINED ROAD
- SOIL, GRAVEL OR STONE SURFACED ROAD
- HARD SURFACED ROAD
- 4 LANE UNDIVIDED HIGHWAY
- DIVIDED HIGHWAY
- HIGHWAY WITH FRONTAGE ROADS
- P.C.A.
- FULL CONTROL ACCESS
- FEDERAL AID INTERSTATE ROAD
- FEDERAL AID PRIMARY ROAD
- FEDERAL AID SECONDARY ROAD
- FEDERAL AID URBAN
- NON-SYSTEM ROAD
- PROJECTED LOCATION
- INTERSECTION DISTANCE
- TRAFFIC CIRCLE
- HIGHWAY INTERCHANGE
- DETAILED HIGHWAY INTERCHANGE
- INTERSTATE HIGHWAY
- U.S. NUMBERED HIGHWAY
- U. S. NUMBERED BICYCLE ROUTE
- N.C. NUMBERED HIGHWAY
- N.C. NUMBERED BICYCLE ROUTE
- INTERSTATE INTERCHANGE NUMBER
- SECONDARY ROAD NUMBER
- UNDERGROUND CABLE
- RAILROAD, ANY NUMBER OF TRACKS USED BY SINGLE OPERATING COMPANY
- RAILROAD, ANY NUMBER OF TRACKS USED BY MORE THAN ONE OPERATING COMPANY ON SAME OR ADJACENT RIGHTS-OF-WAY
- RAILROAD STATION
- GRADE CROSSING
- UNDERPASS
- OVERPASS
- RAILROAD TUNNEL
- ARMY, NAVY, OR MARINE CORPS FIELD
- COMM. OR MUNICIPAL AIRPORT
- MARKED AUXILIARY FIELD
- HANGAR ON FIELD ("S" IN SYMBOL)
- FREE OR TOLL FERRY
- LIGHTHOUSE
- COAST GUARD STATION
- CANAL
- NARROW STREAM
- WIDE STREAM
- DAM WITH LOCK
- DAM
- RESERVOIR, POND, OR LAKE
- PROMINENT PEAK, NUMERALS INDICATE ELEVATION
- ROAD THROUGH MOUNTAIN PASS
- HIGHWAY BRIDGE, OVER 20 FT.
- DRAW SPAN ON BRIDGE
- HIGHWAY TUNNEL
- FORD
- STATE LINE
- COUNTY LINE
- CITY LIMITS
- RESERVATION OR PARK BOUNDARY
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- UNINCORPORATED CENSUS DESIGNATED PLACE
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- TRIANGULATION STATION
- INCORPORATED CITY OR VILLAGE, (GENERALIZED)
- SCHOOL
- CHURCH
- CHURCH WITH CEMETERY
- CEMETERY
- HOSPITAL
- CORRECTIONAL OR PENAL INSTN.
- HIGHWAY GARAGE, OR MAINT. YARD
- HIGHWAY DIV. OR DIST. OFFICE
- WEIGHT STATION
- PATROL STATION
- REST AREA
- MONUMENT – SMALL HISTORICAL SITE

# CONSTRUCTION PLAN

LEGEND

- PROPOSED 4 LN DIVIDED
- PROPOSED 4 LN UNDIVIDED
- PROPOSED 2 LN WIDENING
- METROPOLITAN AREA BOUNDARY

# CABARRUS COUNTY

## NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4
SCALE IN MILES

BASE: 1992

FIGURE 11

# VIII. IMPLEMENTATION

There are several tools available for use by the County to assist in the implementation of a thoroughfare plan. They are as follows:

## A. State-County Adoption of Thoroughfare Plan

As shown in **Figure 10,** the North Carolina Department of Transportation has developed a revised County Thoroughfare Plan. The plan serves as a guide to the Department of Transportation in the development of the highway system for the County.

## B. Subdivision Controls

The subdivision regulations require every subdivider to submit to the County planning commission a plan of the proposed subdivision. It also requires that the subdivision be constructed to certain standards. Through this process, it is possible to require the subdivision streets to conform to the thoroughfare plan and to reserve or protect necessary rights-of-way for projected roads and highways intended to become part of the thoroughfare plan. Constructing subdivision streets to adequate standards will reduce maintenance costs and simplify the transfer of the streets to the State Highway System. Appendix E outlines the recommended design standards.

## C. Land Use Controls

Land use regulations are an important tool regulating future land development and minimizing undesirable development along roads and highways. The land use regulatory system can improve highway safety by requiring sufficient setbacks to provide for adequate sight distances and by requiring off-street parking.

The Cabarrus County Zoning Ordinance has a Thoroughfare Overlay Zone (TOZ) which requires additional setbacks as mentioned. Proper coordination with the Cabarrus County Zoning Department is recommended with future land development.

## D. Funding

The majority of the improvements are scheduled and funded by the Transportation Improvement Program. The Board of Transportation regularly conducts public meetings to obtain input from the public pertaining to their needs for highway improvements.

Not all roadway improvements are covered by this procedure. Nearly all secondary road work is done on a county by county basis. These funds, known as the county construction account, are used to pave unimproved roads, widen roadways, stabilize dirt roads, make minor alignment improvements, and even construct short connectors when appropriate. The County Commissioners are encouraged to work with the Division Engineer when the County's priority list is developed. Many of the minor improvements recommended may be realized by using the County's construction account funds and developing the County's priority list in conjunction with the Division Engineer.

# APPENDIX A

**APPENDIX A**
**TABLE A1**

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

| CABARRUS COUNTY FACILITY AND SECTION | DIST (MI) | RDWAY (FT) | ROW (FT) | PRACTICAL CAPACITY (VPD) | 1990 (ADT) | 2020 (ADT) | RDWAY (ULT) | ROW (ULT) |
|---|---|---|---|---|---|---|---|---|
| US 52: | | | | | | | | |
| Stan Co - Rowan Co | 1.05 | 24 | 60 | 13,000 | 5,500 | 12,900 | *48(B) | 200 |
| (* SEE TIP# R-2903 FOR PROJECT INFORMATION) | | | | | | | | |
| US 601: | | | | | | | | |
| Union Co - NC 200 | 9.96 | 24 | 100 | 13,000 | 5,500 | 13,400 | 48(B) | 200 |
| NC 200 - Urban Bdry | 1.10 | 24 | 100 | 13,000 | 8,100 | 19,400 | 48(B) | 200 |
| --------- CONCORD | | | | | | | | |
| NC 24/27: | | | | | | | | |
| Meck Co - Stanly Co | 8.40 | 24 | 60 | 13,000 | 8,800 | 23,300 | *48(B) | 200 |
| (* SEE TIP# R-615 & R-2104 FOR PROJECT INFORMATION) | | | | | | | | |
| NC 49: | | | | | | | | |
| --------- CONCORD | | | | | | | | |
| NC 601 - NC 73 | 6.71 | 24 | 100 | 13,000 | 10,000 | 26,800 | *48(B) | 200 |
| NC 73 - Stanly Co | 8.34 | 22 | 100 | 12,000 | 5,000 | 11,900 | *48(B) | 200 |
| (* SEE TIP# R-2533 FOR PROJECT INFORMATION) | | | | | | | | |
| NC 73: | | | | | | | | |
| Meck Co - .7m E Meck County | 0.70 | 24 | 60 | 13,000 | 4,300 | 10,600 | 48(B) | 200 |
| --------- CONCORD | | | | | | | | |
| ECL Conc - NC 49 | 6.02 | 24 | 100 | 12,500 | 7,800 | 19,400 | *48(B) | 200 |
| NC 49 - Eagle St | 0.72 | 24 | 60 | 12,000 | 5,600 | 7,760 | ADQ | ADQ |
| Eagle St -College | 0.26 | 30 | 60 | 12,000 | 5,600 | 7,760 | ADQ | ADQ |
| College - ECL M Ple | 0.89 | 36 | 60 | 12,500 | 5,600 | 7,760 | ADQ | ADQ |
| ECL Mt Plea - 1.36m E. of Mt Pleas. | 1.36 | 24 | 60 | 13,000 | 5,300 | 6,000 | ADQ | ADQ |
| 1.36m E of M Plea - Stanly County | 1.70 | 24 | 60 | 13,000 | 5,300 | 13,200 | *48(B) | 200 |
| (* SEE TIP# R-2410 FOR PROJECT INFORMATION) | | | | | | | | |
| NC 73: New Location .5m E of SR 2630 - 1.36m E Mt Pleas | 4.10 | -- | -- | 13,000 | ----- | 7,200 | *24(L) | 150 |
| (* SEE TIP# R-2410 FOR PROJECT INFORMATION) | | | | | | | | |

Recommended Cross-Sections are shown in parenthesis.
PRACTICAL CAPACITY defined as the Level of Service as set for the speed conditions used in Table 5.

**APPENDIX A**
**TABLE A2**

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

| CABARRUS COUNTY FACILITY AND SECTION | DIST (MI) | RDWAY (FT) | ROW (FT) | PRACTICAL CAPACITY (VPD) | 1990 (ADT) | 2020 (ADT) | RDWAY (ULT) | ROW (ULT) |
|---|---|---|---|---|---|---|---|---|
| NC 136: | | | | | | | | |
| SR 1442 - Iredl Co | 3.60 | 22 | 100 | 11,500 | 2,400 | 6,800 | ADQ | ADQ |
| NC 200: | | | | | | | | |
| Stan Co - SR 1267 | 3.12 | 24 | 100 | 11,000 | 3,100 | 7,900 | ADQ | ADQ |
| SR 1267 - MP 3.22 | 0.10 | 24 | 60 | 13,000 | 3,300 | 7,860 | ADQ | ADQ |
| MP 3.22 - US 601 | 1.52 | 24 | 60 | 9,000 | 3,100 | 7,700 | ADQ | ADQ |
| SR 1006: | | | | | | | | |
| **(Mt. Pleasant Rd)** | | | | | | | | |
| Rowan Co -NCL M Ple | 6.60 | 18 | 60 | 9,000 | 500 | 1,960 | 24(L) | ADQ |
| NCL M Ple - NC 73 | 1.03 | 36 | 60 | 12,000 | 4,300 | 9,800 | ADQ | ADQ |
| NC 73 - MP 7.87 | 0.24 | 19 | 60 | 8,000 | 4,300 | 9,800 | 24(L) | ADQ |
| MP 7.87 - MP 9.41 | 1.54 | 22 | 60 | 11,500 | 4,300 | 9,800 | ADQ | ADQ |
| MP 9.41 - US 601 | 8.20 | 18 | 60 | 9,000 | 1,500 | 4,100 | 24(L) | ADQ |
| SR 1106: | | | | | | | | |
| SR 1006 - US 601 | 0.40 | 18 | 60 | 9,000 | ----- | ----- | 24(L) | ADQ |
| SR 1132: | | | | | | | | |
| **(Miami Church Rd)** | | | | | | | | |
| Urban Bdry-SR 1125 | 2.30 | 20 | 60 | 11,000 | 1,600 | 3,600 | ADQ | ADQ |
| SR 1125 - NC 24/27 | 3.90 | 18 | 60 | 9,000 | 1,400 | 3,300 | 24(L) | ADQ |
| SR 1136: | | | | | | | | |
| **(Lower Rocky River)** | | | | | | | | |
| SR 1139 - Meck Co | 4.80 | 18 | 60 | 9,000 | 2,000 | 4,700 | 24(L) | ADQ |
| SR 1139: | | | | | | | | |
| **(Rocky River Road)** | | | | | | | | |
| Meck Co - Urban Bdy | 4.54 | 16 | 60 | 7,500 | 2,500 | 5,900 | 24(L) | ADQ |
| SR 1168: | | | | | | | | |
| **(Robinson Ch. Rd)** | | | | | | | | |
| Meck Co - 1.44m N of Meck Co | 1.44 | 18 | 60 | 9,000 | 2,600 | 6,800 | 24(L) | ADQ |
| 1.44m N of Meck Co- 1.79m N of Meck Co | 0.35 | 20 | 100 | 11,000 | 2,600 | 6,800 | 24(L) | ADQ |
| 1.79m N of Meck Co- Urban Bdry | 1.31 | 20 | 60 | 11,000 | 3,000 | 8,100 | 24(L) | ADQ |

Recommended Cross-Sections are shown in parenthesis.
PRACTICAL CAPACITY defined as the Level of Service as set for the speed conditions used in Table 5.

**APPENDIX A**
**TABLE A3**

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

| CABARRUS COUNTY FACILITY AND SECTION | DIST (MI) | RDWAY (FT) | ROW (FT) | PRACTICAL CAPACITY (VPD) | 1990 (ADT) | 2020 (ADT) | RDWAY (ULT) | ROW (ULT) |
|---|---|---|---|---|---|---|---|---|
| SR 1394: | | | | | | | | |
| **(Poplar Tent Road)** | | | | | | | | |
| 1.17m W of SR 1442- SR 1488 | 0.06 | 24 | 60 | 13,000 | 1,800 | 3,700 | ADQ | ADQ |
| SR 1488 - SR 1449 | 1.10 | 20 | 60 | 10,500 | 1,800 | 3,700 | ADQ | ADQ |
| SR 1449 - Meck Co | 1.20 | 18 | 60 | 9,000 | 1,800 | 3,700 | 24(L) | ADQ |
| SR 1449: | | | | | | | | |
| **(Harris Road)** | | | | | | | | |
| Meck Co - SR 1394 | 1.60 | 22 | 60 | 12,000 | 500 | 1,600 | ADQ | ADQ |
| SR 1601: | | | | | | | | |
| **(Odell School Rd)** | | | | | | | | |
| NC 136 - Urban Bdry | 1.10 | 18 | 60 | 9,000 | 1,650 | 4,000 | 24(L) | ADQ |
| SR 2400: | | | | | | | | |
| **(Barrier Road)** | | | | | | | | |
| Urban Bdy- SR 2411 | 2.50 | 24 | 60 | 12,500 | 450 | 1,200 | ADQ | ADQ |
| SR 2408: | | | | | | | | |
| **(Gold Hill Rd)** | | | | | | | | |
| Urban Bdry- MP 3.10 | 1.70 | 24 | 60 | 12,500 | 2,450 | 5,900 | ADQ | ADQ |
| MP 3.10 - SR 1006 | 4.00 | 18 | 60 | 8,500 | 1,950 | 4,700 | 24(L) | ADQ |
| SR 2411: | | | | | | | | |
| **(Irish Potato Rd)** | | | | | | | | |
| SR 2400 - NC 73 | 4.40 | 24 | 60 | 13,000 | 1,000 | 2,500 | ADQ | ADQ |
| NC 73 - SR 2630 | 2.80 | 18 | 60 | 8,500 | 1,400 | 3,400 | 24(L) | ADQ |
| SR 2630 - SR 1006 | 2.58 | 16 | 60 | 7,500 | 1,200 | 2,700 | 24(L) | ADQ |
| SR 2444: | | | | | | | | |
| **(St. Stephens Ch.)** | | | | | | | | |
| Rowan Co - NC 49 | 5.60 | 22 | 60 | 12,000 | 600 | 1,400 | ADQ | ADQ |
| SR 2622: | | | | | | | | |
| **(Barriers Store Rd)** | | | | | | | | |
| SR 1006 - Stanly Co | 3.50 | 20 | 60 | 11,000 | 750 | 1,960 | ADQ | ADQ |

Recommended Cross-Sections are shown in parenthesis.
PRACTICAL CAPACITY defined as the Level of Service as set for the speed conditions used in Table 5.

**APPENDIX A**
**TABLE A3**

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

| CABARRUS COUNTY FACILITY AND SECTION | DIST (MI) | RDWAY (FT) | ROW (FT) | PRACTICAL CAPACITY (VPD) | 1990 (ADT) | 2020 (ADT) | RDWAY (ULT) | ROW (ULT) |
|---|---|---|---|---|---|---|---|---|
| SR 2635: | | | | | | | | |
| **(Old Airport Road)** | | | | | | | | |
| Urban Bdry - .4m E of Urban Bdry | 0.40 | 20 | 60 | 11,000 | 700 | 2,100 | ADQ | ADQ |
| .4m E of Urban Bdy- NC 49 | 1.70 | 18 | 60 | 9,000 | 700 | 2,100 | ADQ | ADQ |

Recommended Cross-Sections are shown in parenthesis.
PRACTICAL CAPACITY defined as the Level of Service as set for the speed conditions used in Table 5.

# APPENDIX B

## APPENDIX B

**TABLE B1**
CABARRUS COUNTY VEHICLE REGISTRATION

| YEAR | VEHICLES REGISTERED | POPULATION | PERSONS PER VEHICLE |
|---|---|---|---|
| 1940 | 14,485 | 59,393 | 4.10 |
| 1950 | 22,114 | 63,783 | 2.88 |
| 1960 | 33,397 | 68,137 | 2.04 |
| 1970 | 39,483 | 74,629 | 1.89 |
| 1980 | 59,052 | 85,895 | 1.45 |
| 1990 | 77,285 | 98,935 | 1.28 |
| *2000 | 99,827 | 112,805 | 1.13 |
| *2010 | 125,300 | 125,334 | 1.00 |
| *2020 | 137,188 | 133,072 | 0.97 |

**TABLE B2**
NORTH CAROLINA VEHICLE REGISTRATION

| YEAR | VEHICLES REGISTERED | POPULATION | PERSONS PER VEHICLE |
|---|---|---|---|
| 1940 | 647,242 | 3,571,623 | 5.52 |
| 1950 | 1,147,233 | 4,061,929 | 3.54 |
| 1960 | 1,704,203 | 4,556,155 | 2.67 |
| 1970 | 2,742,673 | 5,084,411 | 1.85 |
| 1980 | 3,896,544 | 5,880,095 | 1.51 |
| 1990 | 4,962,268 | 6,628,637 | 1.34 |
| *2000 | 6,851,590 | 7,399,683 | 1.08 |
| *2010 | 8,235,600 | 8,070,889 | 0.98 |

* Projected population statistics supplied by North Carolina State Data Center.

# APPENDIX C

## APPENDIX C

### Typical Cross Sections

Typical cross sections recommended by the Thoroughfare Planning Unit are shown in Figure C1, and listed in Appendix A, Table A1-A3.

Cross section "A" is typical for controlled access freeways. The 46 foot grassed median is the minimum median width. Wider variations could result depending upon design considerations. Slopes of 8:1 into 3 foot drainage ditches are desirable for traffic safety. Right-of-way requirements would typically vary upward from 250 feet depending upon cut and fill requirements.

Cross section "B" is typical for four lane divided highways in rural areas that may have only partial or no control of access. The minimum median width for this cross section is 30 feet, but a wider median is desirable. Design requirements for slopes and drainage would be similar to cross section "A", but there may be some variation from this depending upon right-of-way constraints.

Cross section "C", seven lane urban, and cross section "D", five lane urban, are typical for major thoroughfares where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

Cross sections "E" and "F" are used on major thoroughfares where left turns and intersecting streets are not as frequent. Left turns would be restricted to a few selected intersections.

Cross section "G" is recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 feet is recommended with 30 feet being desirable.

Typical cross section "H" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes, but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would probably be required at major intersections.

Thoroughfares which are proposed to function as one-way traffic carriers would typically require cross section "I".

Cross sections "J" and "K" are recommended for minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross section "J" would be used on those minor thoroughfares where parking on both sides is needed as a result of more concentrated development.

Cross section "L" is used in rural areas or for staged construction of a wider multilane cross section. On some thoroughfares, projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time.

The curb and gutter cross sections all illustrate the sidewalk next to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk farther away from the street to provide added separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

Rights-of-way shown for the typical cross sections are the minimum rights-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

If there is sufficient bicycle traffic along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to allow for the bicycle facilities. The North Carolina Bicycle Facility and Program Handbook should be consulted for bicycle facility design standards.

Recommended typical cross sections for thoroughfares were derived using projected traffic, existing capacities, desirable levels of service, and available right-of-way.

## APPENDIX C

### Typical Cross Sections

Typical cross sections recommended by the Thoroughfare Planning Unit are shown in Figure C1, and listed in Appendix A, Table A1-A3.

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Cross section "B" is typical for four lane divided highways in rural areas that may have only partial or no control of access. The minimum median width for this cross section is 30 feet, but a wider median is desirable. Design requirements for slopes and drainage would be similar to cross section "A", but there may be some variation from this depending upon right-of-way constraints.

Cross section "C", seven lane urban, and cross section "D", five lane urban, are typical for major thoroughfares where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

Cross sections "E" and "F" are used on major thoroughfares where left turns and intersecting streets are not as frequent. Left turns would be restricted to a few selected intersections.

Cross section "G" is recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 feet is recommended with 30 feet being desirable.

Typical cross section "H" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes, but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would probably be required at major intersections.

Thoroughfares which are proposed to function as one-way traffic carriers would typically require cross section "I".

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The curb and gutter cross sections all illustrate the sidewalk next to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk farther away from the street to provide added separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

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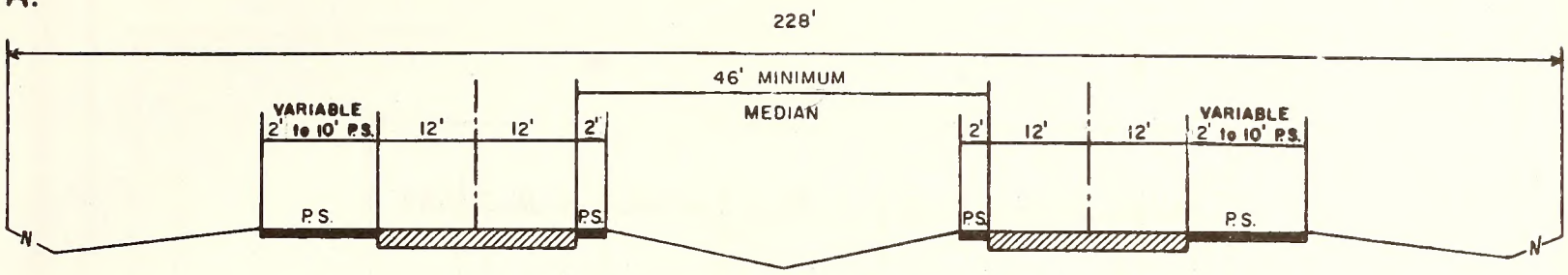
If there is sufficient bicycle traffic along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to allow for the bicycle facilities. The North Carolina Bicycle Facility and Program Handbook should be consulted for bicycle facility design standards.

Recommended typical cross sections for thoroughfares were derived using projected traffic, existing capacities, desirable levels of service, and available right-of-way.

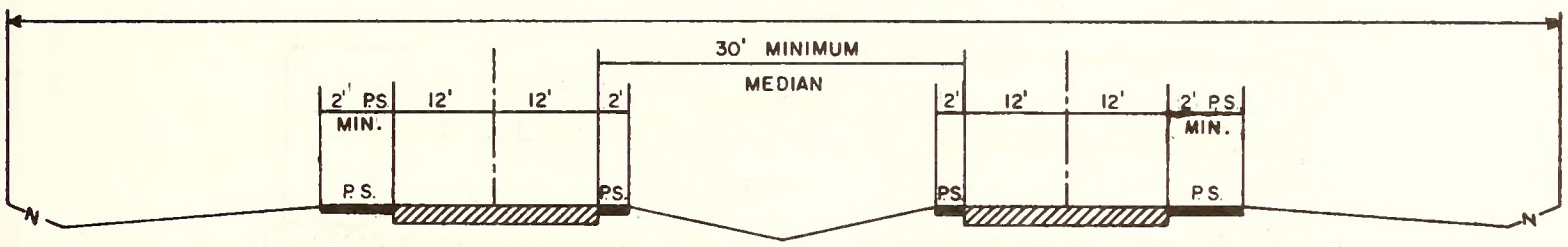
# TYPICAL THOROUGHFARE CROSS SECTIONS

A.



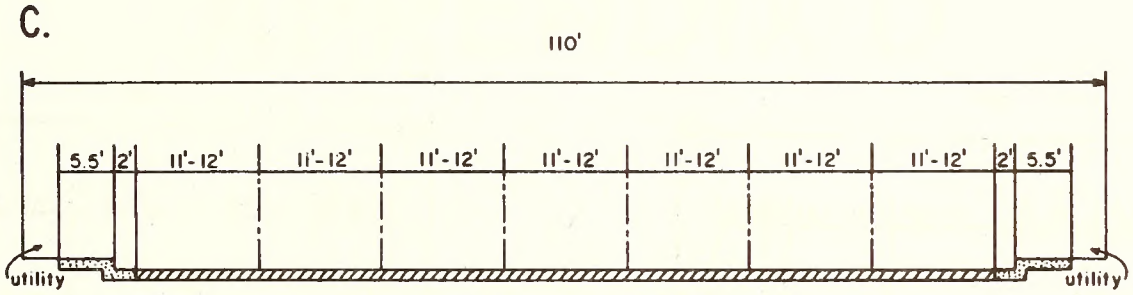

FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



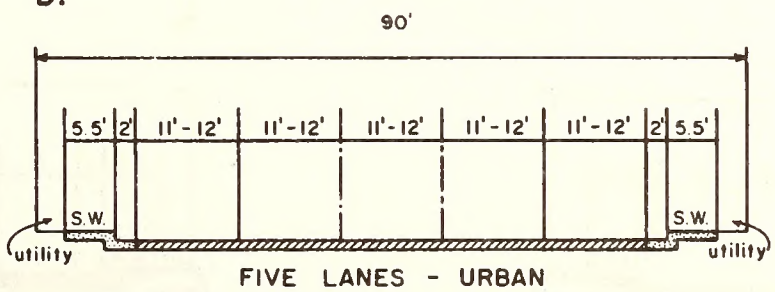

FOUR LANES DIVIDED WITH MEDIAN - RURAL

C.



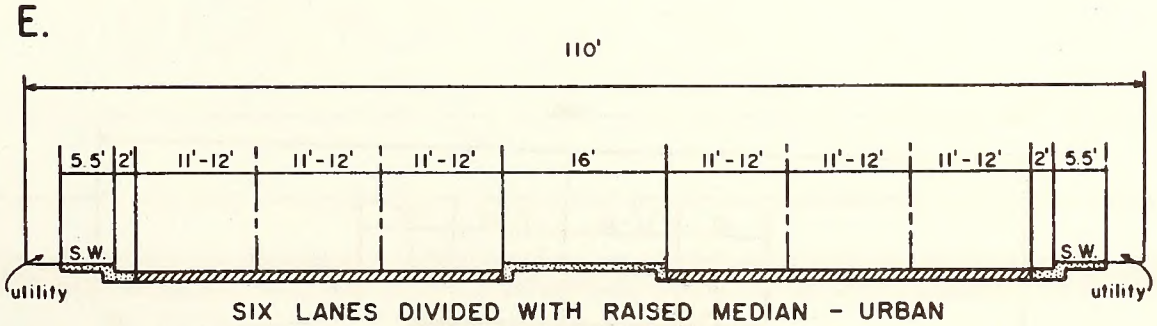

SEVEN LANES - URBAN

D.




FIVE LANES - URBAN

E.

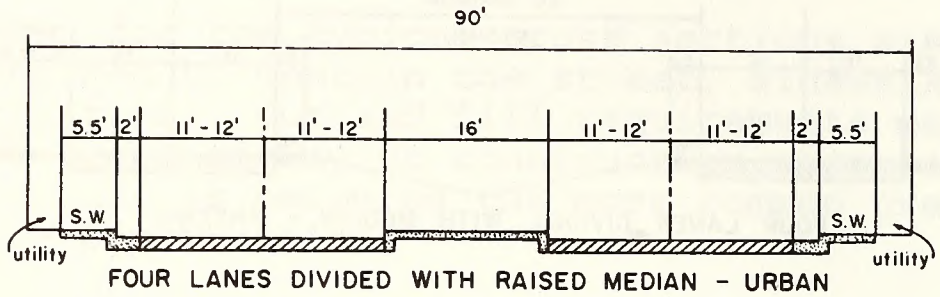



SIX LANES DIVIDED WITH RAISED MEDIAN - URBAN

**FIGURE C-1**

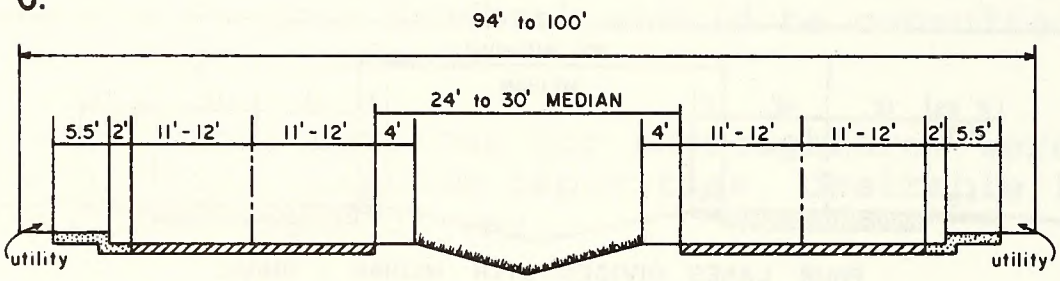
# TYPICAL THOROUGHFARE CROSS SECTIONS
(CONTINUED)

F.



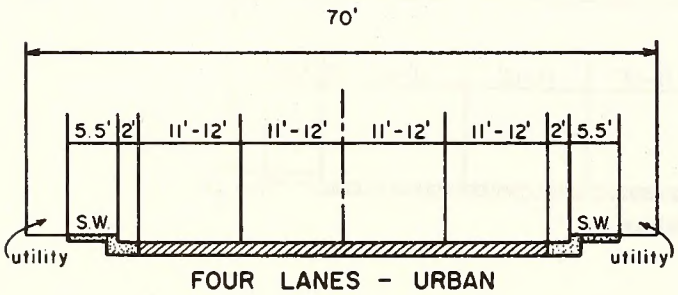

FOUR LANES DIVIDED WITH RAISED MEDIAN - URBAN

G.



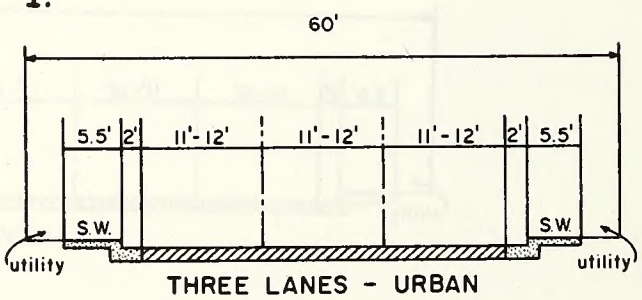

FOUR LANES DIVIDED - URBAN BOULEVARD
GRASS MEDIAN

H.



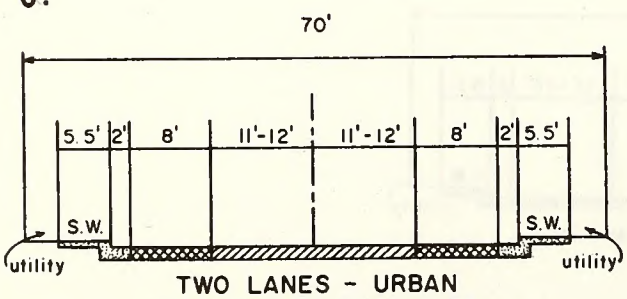

FOUR LANES - URBAN

I.



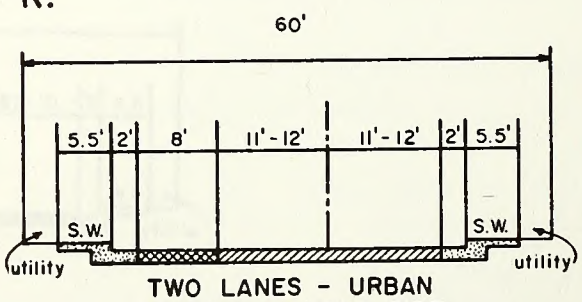

THREE LANES - URBAN

J.



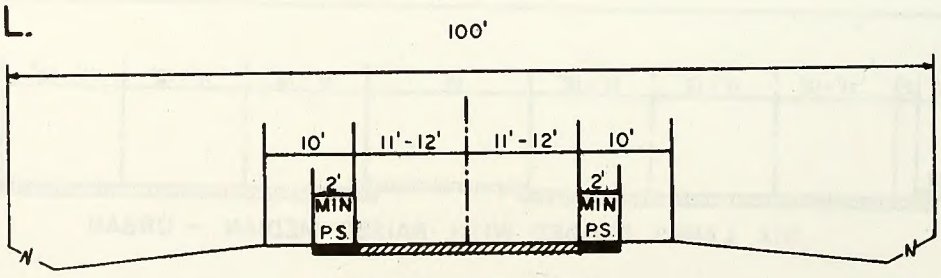

TWO LANES - URBAN
PARKING ON EACH SIDE

K.




TWO LANES - URBAN
PARKING ON ONE SIDE

L.




TWO LANES - RURAL

# APPENDIX D

## APPENDIX D

## RECOMMENDED SUBDIVISION ORDINANCES

Definitions

I. Streets and Roads:

A. Rural Roads

1. Principal Arterial - A rural link in a highway system serving travel, and having characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of Interstate routes and other routes designated as principal arterials.

2. Minor Arterial - A rural roadway joining cities and larger towns and providing intrastate and inter-county service at relatively high overall travel speeds with minimum interference to through movement.

3. Major Collector - A road which serves major intra-county travel corridors and traffic generators and provides access to the Arterial system.

4. Minor Collector - A road which provides service to small local communities and traffic generators and provides access to the Major Collector system.

5. Local Road - A road which serves primarily to provide access to adjacent land, over relatively short distances.

B. Urban Streets

1. Major Thoroughfares - Major thoroughfares consist of Interstate and other freeway, expressway, or parkway roads, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.

2. Minor Thoroughfares - Minor thoroughfares collect traffic from local access streets and carry it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating minor through-traffic movements and may also serve abutting property.

3. Local Street - A local street is any street not on a higher order urban system and serves primarily to provide direct access to abutting land.

C. Specific Type Rural or Urban Streets

1. Freeway, expressway, or parkway - Divided multilane roadways designed to carry large volumes of traffic at high speeds. A freeway provides for continuous flow of vehicles to selected crossroads only by way of interchanges. An expressway is a facility with full or partial control of access and generally with grade separations at major intersections. A parkway is for non-commercial traffic, with full or partial control of access.

2. Residential Collector Street - A local street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.

3. Local Residential Street - Cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.

4. Cul-de-sac - A short street having only one end open to traffic and the other end being permanently terminated and a vehicular turn-around provided.

5. Frontage Road - A road that is parallel to a partial or full access controlled facility and provides access to adjacent land.

6. Alley - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

II. Property

A. Building Setback Line

A line parallel to the street in front of which no structure shall be erected.

B. Easement

A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.

C. Lot

A portion of a subdivision, or any other parcel of land, which is intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".

## III. Subdivision

### A. Subdivider

Any person, firm, corporation or official agent thereof, who subdivides or develops any land deemed to be a subdivision.

### B. Subdivision

All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, immediate or future, of sale or building development and all divisions of land involving the dedication of a new street or change in existing streets; provided, however, that the following shall not be included within this definition nor subject to these regulations: (1) the combination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein; (2) the division of land into parcels greater than ten acres where no street right-of-way dedication is involved; (3) widening of open streets; (4) the division of a tract in single ownership whose entire area is no greater than two acres into not more than three lots, where no street right of way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

### C. Dedication

A gift, by the owner, of his property to another party without any consideration being given for the transfer. The dedication is made by written instrument and is completed with an acceptance.

### D. Reservation

Reservation of land does not involve any transfer of property rights. It constitutes an obligation to keep property free from development for a stated period of time.

# APPENDIX E

APPENDIX E

DESIGN STANDARDS

I. Streets and Roads

The design of all roads within Cabarrus County shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway Officials' (AASHTO) manuals.

The provision of street rights-of-way shall conform and meet the recommendations of the Thoroughfare Plan, as adopted by Cabarrus County and the North Carolina Department of Transportation.

The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

The urban planning area shall consist of that area within the urban planning boundary as depicted on the mutually adopted Thoroughfare Plan. The rural planning area shall be that area outside the urban planning boundary.

A. Street Widths

Width for street and road classifications other than local shall be as required by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

1. Local Residential-
   Curb and Gutter section: 26 feet, face to face of curb
   Shoulder section: 20 feet to edge of pavement, 4 foot shoulders

2. Residential Collector-
   Curb and Gutter section: 34 feet, face to face of curb
   Shoulder section: 20 feet to edge of pavement, 6 foot shoulders

B. Right-of-Way Widths

Right-of-way (ROW) widths shall not be less than the following and shall apply except in those cases where ROW requirements have been specifically set out in the Thoroughfare Plan.

| 1. Rural | Minimum ROW |
|---|---|
| a. Principle Arterial | |
| Freeways | 350 ft. |
| Other | 200 ft. |
| b. Minor Arterial | 100 ft. |
| c. Major Collector | 100 ft. |
| d. Minor Collector | 80 ft. |
| e. Local Road | * 60 ft. |

2. Urban

| | | |
|---|---|---|
| a. | Major Thoroughfare other than Freeway and Expressway | 90 ft. |
| b. | Minor Thoroughfare | 70 ft. |
| c. | Local Street | * 60 ft. |
| d. | Cul-de-sac | ** Variable |

The subdivider will only be required to dedicate a maximum of 100 feet of right-of-way. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. On all cases in which right-of-way is sought for a fully controlled access facility, the subdivider will only be required to make a reservation. It is strongly recommended that subdivisions provide access to properties from internal streets, and that direct property access to major thoroughfares, principle and minor arterials, and major collectors be avoided. Direct property access to minor thoroughfares is also undesirable.

A partial width right-of-way, not less than sixty feet in width may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is subdivided, the remainder of the full required right-of-way shall be dedicated.

* The desirable minimum right-of-way (ROW) is 60 ft. If curb and gutter is provided, 50 feet of ROW is adequate on local residential streets.

** The ROW dimension will depend on radius used for vehicular turn-around. Distance from edge of pavement of turn-around to ROW should not be less than distance from edge of pavement to ROW on street approaching turnaround.

C. Geometric Characteristics

The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under Right-of-Way shall apply.

1. Design Speed - The design speed for a roadway should be a minimum of 5 mph greater than the posted speed limit. The design speeds for subdivision type streets shall be as follows:

| DESIGN SPEEDS | | | | |
|---|---|---|---|---|
| Facility Type | Desirable Speed | Minimum Speed | | |
| | | Level | Rolling | Mountain |
| Rural | | | | |
| Minor Collector Roads | 60 | 50 | 40 | 30 |
| Local roads, including Residential Collectors and Local Residential | 50 | * 50 | *40 | *30 |
| Urban | | | | |
| Major Thoroughfares, other than Freeway, Expressway, or Parkway | 60 | 50 | 50 | 50 |
| Minor Thoroughfares | 60 | 50 | 40 | 40 |
| Local Streets | 40 | **40 | **30 | **30 |

*Based on projected annual average daily traffic of 400-750. In cases where road will serve a limited area and small number of dwelling units, minimum design speeds can be reduced further.

** Based on projected annual average daily traffic of 50-250.

2. Maximum and Minimum Grades

a. The maximum vertical grades shall be as follows:

| MAXIMUM VERTICAL GRADE % | | | |
|---|---|---|---|
| | Terrain | | |
| Design Speed | Level | Rolling | Mountain |
| 60 | 4 | 5 | 6 |
| 50 | 5 | 6 | 7 |
| 40 | 6 | 7 | 8 |
| 30 | --- | 9 | 10 |
| 20 | --- | --- | 12 |

b. A minimum grade for curbed streets should not be less than 0.5%.

c. Grades for 100 feet each way from intersections (measured from edge of pavement) should not exceed 5%.

d. For streets and roads with projected annual average daily traffic less than 250, short grades less than 500 feet long may be 50% greater than the value in the above table.

3. Minimum Sight Distance - In the interest of public safety, no less than the minimum sight distance applicable shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters:

| SIGHT DISTANCE | | | | |
|---|---|---|---|---|
| Design Speed, MPH | 30 | 40 | 50 | 60 |
| Stopping Sight Distance: | | | | |
| Minimum (ft.) | 200 | 275 | 400 | 525 |
| Desirable Minimum (ft.) | 200 | 325 | 475 | 650 |
| Minimum K* Value for: | | | | |
| Crest Curve | 30 | 80 | 160 | 310 |
| Sag Curve | 40 | 70 | 110 | 160 |
| Passing Sight Distance: | | | | |
| Minimum Passing Distance for 2 lanes, in feet | 1,035 | 1,460 | 1,915 | 2,380 |

* K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet of the vertical curve which will provide the desired sight distance.

(General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case.)

Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1984".

4. The "Super-elevation Table" below shows the maximum degree of curve and related maximum super-elevation for design speeds. The maximum rate of roadway super-elevation (e) for rural roads with no curb and gutter is 0.08. The maximum rate of super-elevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.

| SUPER-ELEVATION TABLE | | | |
|---|---|---|---|
| Design Speed | Maximum e* | Minimum Radius ft. | Max. Deg. of Curve |
| 30 | 0.04 | 302 | 19 00′ |
| 40 | 0.04 | 573 | 10 00′ |
| 50 | 0.04 | 955 | 6 00′ |
| 60 | 0.04 | 1,528 | 3 45′ |
| 30 | 0.06 | 273 | 21 00′ |
| 40 | 0.06 | 509 | 11 15′ |
| 50 | 0.06 | 849 | 6 45 |
| 60 | 0.06 | 1,380 | 4 15′ |
| 30 | 0.08 | 252 | 22 45′ |
| 40 | 0.08 | 468 | 12 15′ |
| 50 | 0.08 | 764 | 7 30′ |
| 60 | 0.08 | 1,206 | 4 45′ |

* e = rate of roadway super-elevation, foot per foot

D. Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty-five (65) degrees.

2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.

3. Offset intersections are to be avoided. Intersections which cannot be aligned should be separated by a minimum length of 200 feet between survey centerlines.

E. Cul-de-sacs

Cul-de-sacs shall not be more than seven hundred (700) feet in length. The distance from the edge of pavement on the vehicular turnaround to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turnaround. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

F. Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provision is made for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.

2. The width of an alley shall be at least twenty (20) feet.

3. Dead-end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turnaround facilities at the dead-end as may be required by the Planning Board.

G. Permits For Connection To State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the District Engineer of the Division of Highways.

H. Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet from the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 6 feet from the face of curb.

I. Wheelchair Ramps

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

Wheelchair ramps and depressed curbs shall be constructed in accordance with details contained in the Department of Transportation, Division of Highways, publication entitled, "Guidelines, Curb Cuts and Ramps for Handicapped Persons."

J. Horizontal Width on Bridge Deck

1. The clear roadway widths for new and reconstructed bridges serving 2 lane, 2 way traffic should be as follows:

   a. Shoulder section approach

      i. Under 800 ADT design year:

         Minimum 28 feet width face to face of parapets of rails or pavement width plus 10 feet, whichever is greater.

ii. 800 - 2000 ADT design year:

Minimum 34 feet width face to face of parapets of rails or pavement width plus 12 feet, whichever is greater.

iii. Over 2000 ADT design year:

Minimum width of 40 feet, desirable width of 44 feet width face to face of parapets of rails.

b. Curb and gutter approach

i. Under 800 ADT design year:

Minimum 24 feet face to face of curbs.

ii. Over 800 ADT design year:

Width of approach pavement measured face to face of curbs.

Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face of curbs, and in crown drop. The distance from face of curb to face of parapet or rail shall be 1'6" minimum, or greater if sidewalks are required.

2. The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:

a. Shoulder section approach - Width of approach pavement plus width of usable shoulders on the approach left and right. (Shoulder width 8' minimum, 10' desirable.)

b. Curb and gutter approach - Width of approach pavement measured face to face of curbs.

# APPENDIX F

GENERAL ASSEMBLY OF NORTH CAROLINA
1993 SESSION
RATIFIED BILL

CHAPTER 478
HOUSE BILL 815

AN ACT AUTHORIZING VARIOUS COUNTIES TO ASSIST THOROUGHFARE PLAN IMPLEMENTATION.

The General Assembly of North Carolina enacts:

Section 1. A county may expend funds, not otherwise limited as to use by law, and may exercise the power of eminent domain, following procedures authorized to counties by general law, for the purpose of acquiring land or rights-of-way for thoroughfare construction and improvement projects which have been included in:

(1) A Department of Transportation annual construction program or a multiyear transportation improvement program;
(2) A roadway corridor official map adopted by the Board of Transportation or a municipal governing board;
(3) A comprehensive street system plan, collector street plan, or thoroughfare plan adopted by local governments or their planning agencies; or
(4) A transportation improvement plan adopted by a metropolitan planning organization.

Sec. 2. A county may accept donations and dedications of land or rights-of-way for the construction and improvement of streets, highways, or other thoroughfares included in the official plans and programs listed in Section 1 of this act.

Sec. 3. A county may, pursuant to the authority of G.S. 160A-461, for interlocal undertakings, enter into agreements with municipal governments in the county to provide funding assistance to them for the purpose of acquiring land or rights-of-way for the design, construction, or improvement of streets, highways, or other thoroughfares included in the official plans or programs listed in Section 1 of this act.

Sec. 4. Any land or rights-of-way acquired by a county, pursuant to this act, shall, prior to use for street, highway, or thoroughfare construction or improvement, be transferred to the governmental agency (Department of Transportation or municipality) which is carrying out the construction or improvement.

Sec. 5. Nothing in this act shall be construed to authorize a county to undertake actual construction or improvement of streets, highways, or thoroughfares.

Sec. 5.1. This act applies only to Burke, Cabarrus, and Mecklenburg Counties.

Sec. 6. This act is effective upon ratification.

In the General Assembly read three times and ratified this the 23rd day of July, 1993.

DENNIS A. WICKER

Dennis A. Wicker
President of the Senate

DANIEL BLUE, JR.

Daniel Blue, Jr.
Speaker of the House of Representatives

16th day of July, 1992.

S.B. 1121 CHAPTER 966

AN ACT TO AUTHORIZE CABARRUS COUNTY TO ACQUIRE LAND FOR ROAD RIGHTS-OF-WAY FOR CONNECTORS BETWEEN SUBDIVISIONS AND CONNECTORS BETWEEN

SUBDIVISIONS AND STATE-MAINTAINED ROADS BY DEDICATION AND ACCEPTANCE, PURCHASE, OR EMINENT DOMAIN.

*The General Assembly of North Carolina enacts:*

**Section 1.** Cabarrus County may acquire land for road rights-of-way for connectors serving county or other public facilities or in the vicinity thereof between subdivisions and connectors between subdivisions and State-maintained roads by dedication and acceptance, purchase, or eminent domain.

**Sec. 2.** Cabarrus County may appropriate and spend up to fifty thousand dollars ($50,000) per project under this act but in no event shall total expenditures for all projects exceed one hundred thousand dollars ($100,000) per annum.

**Sec. 3.** In order to fund acquisitions authorized by Section 1, Cabarrus County may use non-ad valorem tax revenues and any other revenues not otherwise restricted by law, including funds authorized by vote of the citizens, to fund the acquisition costs for a project.

**Sec. 4.** Cabarrus County may accept donations and dedication of land or rights-of-way for the purposes set forth in Section 1.

**Sec. 5.** Nothing in this act shall be construed to limit or otherwise interfere with the rights and privileges of the Board of Transportation with respect to any project which is under the authority and control of the Board of Transportation or to authorize or require Cabarrus County to undertake actual construction or improvement of streets, highways, or thoroughfares.

**Sec. 6.** This act is effective upon ratification and expires July 1, 1995.

In the General Assembly read three times and ratified this the 16th day of July, 1992.

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